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LIVESTOCK FEED PROCUREMENT

REQUIREMENT FOR ACCELERATING FEED PROCUREMENT OPERATIONS EMPHASIZED

Moscow SEL'SKAYA ZHIZN' in Russian 21 Jun 81 p 2

[Article by Yu. Novoselov, doctor of agricultural sciences and I. Smurygin and V. Toshchilin, candidates of agricultural sciences at All-Union Institute of Feeds: "Eliminate Delays in the Procurement of Feed"]

[Text] In carrying out any type of work, a farmer must take into account the weather conditions. Thus, the unstable weather experienced in the spring of this year in the nonchernozem zone complicated the organization of the sowing of forage crops, while the dry hot weather has accelerated considerably the development of the forage crops. In all areas they are surpassing the average schedules established over a period of many years by 5-12 days. Thus it is most important for the feed procurement work to be started on time and to be carried out rapidly.

The best period for harvesting the cereal grasses is from the shooting to the heading phase and for the leguminous grasses -- the budding phase. It is at these times that the grasses contain 0.9-1 feed unit and 104-107 grams of protein in a kilogram of dry substance. When the harvesting is carried out during the blossoming phase, a sharp decrease occurs in the nutritional value and protein content of the feed and, compared to the budding phase, one fourth of the feed units and almost one half of the protein are lost.

In a number of oblasts, owing to a deficit of moisture, the clover and alfalfa have turned out to be 5-15 centimeters lower than usual. On some farms the workers are waiting until they grow taller. But growth in the grasses has ceased, they are seasoning rapidly and even abundant rainfall does not add substantially to their yields. Thus it is very important for such grasses to be harvested immediately. The first cutting of the cereal grasses should be completed no later than 25 June and that for the leguminous grasses -- 1-5 July. If this is not done, a large quantity of feed may be lost and its quality may deteriorate. Thus, in the hay of perennial cereal grasses harvested during the heading to the commencement of blossoming period, the digestibility of the protein reaches 68 percent, the cellulose -- 70 and the nitrogen-free extractive substances -- 75 percent. When the harvesting is carried out during the blossoming period, the figures are 60, 63 and 69 respectively and following blossoming -- 47, 55 and 65 percent. Thus the advantage lies with those farms which carry out their first cutting rapidly.

This has been borne out by both science and practical experience. Nevertheless, during the best periods the grasses are being harvested only on limited areas.

Instead of just 7-12 days, the mowing of these grasses continues for a month or more on some farms. In recent years, the first cutting of grasses has been carried out during the best periods only on 41-42 percent of the areas. This shortcoming must be corrected in a decisive and consistent manner.

If the first cutting is harvested in a timely manner and if the after-growth is watered well during the second half of the summer, it is possible to obtain a full-value second and even a third cutting and to increase noticeably the overall feed harvest.

In many regions of the country, favorable conditions have developed for obtaining high yields of corn for silage. In order to raise its value, it is important to obtain the ears during the period of milk-waxy ripeness. This increases the per hectare yield of nutrients by 25-30 percent. Even in the northern regions, the corn had reached the phase of 5-6 or more leaves by 10 June, whereas only the seedlings had appeared by this same time last year. At the present time, the tending of the corn plantings must be organized and efforts undertaken to combat the weeds and pests.

Corn is one of the most responsive crops as far as irrigation is concerned. Each cubic meter of water expended for watering it furnishes 2-2.5 additional feed units. Corn plants begin to suffer from a shortage of moisture when the water capacity of the soil is lower than 70 percent. Waterings are especially important during the period in which the embryonic ears are forming (stage of 9-11 leaves): a deficit of moisture at this time lowers the yield of the more valuable grain portion. In order to make the best use of irrigation water, especially on heavy textured soils, slitting should be carried out prior to watering and following watering -- light loosening of the soil.

The best period for harvesting corn for silage is the phase of milky-waxy or waxy ripeness of the grain. If harvested earlier, there will be a shortfall per hectare of up to 40 percent in feed units and 20 percent in protein. A kilogram of corn silage harvested during the phase of waxy ripeness of the grain contains 0.25-0.27 feed units and during the milky ripeness phase -- only 0.15-0.17 feed units. Meanwhile, they are beginning to harvest this crop in all areas during the milky ripeness phase, even in those regions where it reaches the waxy phase. This leads to a great shortfall in the amount of nutrients obtained and it lowers sharply the quality of the silage.

This year the plantings of fodder roots have been expanded. The thinning out of the plants must be completed as rapidly as possible and optimum densities must be created for the plantings: 70,000-80,000 plants on non-irrigated tracts and on irrigated tracts -- 90,000-100,000 plants per hectare. The miner fly can cause great damage to root crops during dry and hot weather. Rogor, chlorophos and other phosphorus-organic preparations should be used against this pest.

Extremely favorable conditions are being created this year for expanding the post-harvest and post-cutting plantings. The grain crops are also developing more rapidly than usual and their harvesting is commencing earlier. For example, the development of the winter grain crops in the nonchernozem zone is surpassing the average periods established over a period of many years by 7-12 days. As a result, after they have been harvested, no less than 60 frost-free days having a total amount of active temperatures of 800-900 degrees will remain. This is fully sufficient for obtaining

from each hectare 150-200 quintals of a pea-oats-sunflower mixture or mustard family crops -- spring and winter raps, oil-bearing radishes, white mustard. Even more effective are intermediate plantings on irrigated land in the southern part of the country where, towards this end, use is being made of corn, millet, sunflowers and annual grass mixtures and in the case of late sowing periods -- mustard family crops.

The principal condition for success -- the immediate sowing of intermediate crops once the fields have been cleared.

In order to obtain 15-16 kilograms of milk from a cow daily, it must be provided with no less than 60 kilograms of fodder, either in the form of pasture feed or in a feeding trough. Thus importance is attached to constantly maintaining a high level of productivity for the haying and pasture lands and employing fertilizers and irrigation.

The work is being hampered by frequent violations of the feed procurement technology. The selection of a particular technology must be determined by the economic need, by the available logistical base and by the weather conditions prevailing during the feed procurement period. Under some conditions, a preference must be shown for the procurement of hay, for others -- laying in of haylage and for yet a third set of conditions -- silage.

The quality of the hay is dependent mainly upon how rapidly the mown grasses dry out. Unfortunately, on many farms these grasses are allowed to lie for extended periods of time in gang-mows, where they rapidly lose their quality. In view of the present weather conditions, special importance is attached to picking up the mown grasses rapidly and placing the hay in large (no less than 30 tons) ricks and covering them on the surface with straw or other low-value coarse feeds.

During the past few years, silage has had a high moisture and acidity content. The nutritional value of such feed is low, it contains practically no sugar and large amounts of protein and carotene are lost. This occurs owing to the fact that the perennial and annual grasses selected for silage are not dry-cured to the optimum moisture content -- 65-70 percent. For such crops as corn, sunflowers and others, harvested during the early phases of growth, this method is unacceptable. Thus straw must be added when placing excessively damp raw materials (75-80 percent or higher) in storage. This serves to solve two tasks: the moisture content of the ensiled raw material is lowered and the nutritional value of the straw is raised by 10-12 percent. When ensiling straw, use should ideally be made of caustic soda, ammonia liquor or liquid ammonia. The most effective method for reducing losses when carrying out ensiling work is that of chemical preservation. It fully protects the nutrients, including up to 95 percent of the sugar.

Great results are being obtained from the correctly organized production of grasses into haylage. The storing of grasses in the form of haylage makes it possible to use multiple cuttings of perennial grasses during the early phases of growth and to obtain high quality feed. The best haylage is being obtained in silos. And the quality of the feed and its yield are higher here than they are in trenches.

It is also possible to obtain good quality feed in trenches provided the technology is strictly observed. In almost all areas, with the exception of Siberia, it is

best to build the ground trenches 9-15 meters wide for haylage and 12-15 meters wide for silage.

The feed stored in trenches must necessarily be covered on the surface by an airtight material, preferably by a polymer plastic film. But special films are required for covering silage and haylage. Such films should be 6-12 meters wide and be resistant to the effects of the sun's rays and low temperatures and they should possess a high durability against tearing or breaking.

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REGIONAL DEVELOPMENT

RAPID ESTABLISHMENT OF FOOD COMPLEX IN BAM ZONE URGED

Moscow EKONOMICHESKAYA GAZETA in Russian No 8, Feb 81 p 8

Article by V. Gabov, manager of a division of the Siberian Scientific Research Institute of Economics of Agriculture, settlement of Krasnoobsk, Novosibirskaya Oblast: "The Food Complex of the BAM"

Text At present the provision of the population of the BAM Baykal-Amur Trunk Line zone with food products is carried out through their delivery from the country's various regions. The expenditures on the delivery of products greatly exceed their production costs.

The studies made by the institutes of the Siberian Department of the All-Union Academy of Agricultural Sciences imeni V. I. Lenin and other organizations showed that in most sections of the BAM zone there were possibilities for a considerable increase in the production of milk, potatoes and vegetables.

According to calculations, in this zone it is possible to develop 115,000 to 120,000 hectares of new land and to carry out reclamation work on an area of 145,000 hectares of existing agricultural land. The cattle stock can be increased to 97,000 or 100,000 head.

It is advisable to build poultry farms of egg specialization and hothouse combines near big cities on the utility lines of industrial enterprises.

Along with the development of sovkhozes and subsidiary farms of industrial enterprises and organizations it appears that it is advisable to also take measures to develop the private subsidiary farms of workers and employees. It is also necessary to manifest special concern for the development of agricultural machines in the northern version.

High rates of work on the economic development of the zone gravitating toward the BAM have been envisaged during the 11th Five-Year Plan. The population and, consequently, the need for food products will increase. Therefore, the food complex of the BAM should be established at outstripping rates.

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CSO: 1824/324

REGIONAL DEVELOPMENT

AGRICULTURAL DEVELOPMENT IN BAM ZONE DISCUSSED

Moscow SEL'SKOYE KHOZYAYSTVO ROSSII in Russian No 2, Feb 81 pp 21-22

Article by G. Shmakov, chief of the Main Production Administration of the Far Eastern Region of the RSFSR Ministry of Agriculture: "Prospects for the Development of Agriculture in the BAM Zone"

Text A successful construction of the BAM Baykal-Amur Trunk Line and its further operation require reliable rears capable of providing the important construction project with all the necessary materials, primarily food products. Therefore, the agrarian sector of the BAM must solve complex and important problems. After all, in the zone and adjacent areas by 1990 the population will more than double.

In order to provide such a number of people with food, every year it is necessary to deliver about 130,000 tons of food grain, 133,000 commodity potatoes, 165,000 tons of vegetables, 235,000 tons of whole milk products, 122,000 tons of meat and about 460 million eggs there. To be sure, it is very complex to immediately achieve such goals. Therefore, the agricultural development of the zone should be carried out in several stages, conforming with the development of territorial-industrial complexes.

The prospects for the development of eight such formations have now been determined in the BAM zone. They are Upper Lena, North Baikal, Udokan, South Yakutia, West Amur, Zeysko-Svobodnenskiy, Urgal'skiy and Komsomol'sk. On the territory adjacent to them there are 110,000 hectares of agricultural land, including about 40,000 hectares of arable land. A total of 100,000 hectares of agricultural land, of which arable land will amount to one-half, can be developed by 1990. Such a scale of development of agriculture will require 820 million rubles of capital investments.

At the same time, however, owing to different natural and economic conditions, the level of meeting the needs of the population of territorial-industrial complexes for food products from local production will be different and by 1990 will comprise the following (table, percent of the need).

As can be seen from the table, the zone population will not be provided with food products in a full volume and assortment from local production. Moreover, calculations show that there is no economic need for this. After all, the establishment of the food base of the BAM should proceed in several directions simultaneously.

Territorial- Production Complex	Agricultural Produce				
	potatoes	open-ground vegetables (local as- sortment)	whole milk	meat (in carcass weight)	eggs
Upper Lena	100	100	100	13	100
North Baikal	107	156	50	23	100
Udokan	9.9	23.5	39.7	4.1	100
South Yakutia	-	-	12.0	1.0	100
West Amur	23.6	31.4	38.9	9.0	100
Zeysko-Svobodnenskiy	130	94	84	13	100
Urgal'skiy	84	43.1	50	16	100
Komsomol'sk	58	65.6	31.2	26.2	100
Total in the zone	62	60.4	46.5	15.8	100

An expansion of the production capacities of existing farms and production intensification in the BAM zone represent the first direction. For example, the hog breeding complex on the Dzerzhinskiy Sovkhoz for 54,000 head and hothouse combines on the Vostok and Molodezhnyy sovkhozes of a total capacity of 23.2 hectares were built and put into operation. In all, on 23 farms adjoining the Far Eastern section of the BAM route last year the production of potatoes increased by 15 percent, of milk, by 12 percent, of vegetables, by 56 percent, of eggs, by 3 percent and of meat, by 150 percent. In the future all of them will be able to attain even better results. As a result of an improvement in labor organization and strengthening of the production base it is possible to increase output by another 10 to 15 percent.

However, even this will be insufficient. That is why managers of territorial economic bodies must pay serious attention to the second direction in the development of the agrarian sector--establishment of new sovkhozes and subsidiary farms in all territorial production complexes. The plans are as follows: Five sovkhozes, five hothouse combines (41 hectares), six subsidiary farms, four poultry farms for 500,000 to 600,000 laying hens, a livestock breeding complex and a dairy farm will have to be organized in the zone by 1985-1990. In particular, the new capacities will ensure the keeping of 28,000 cows and 110,000 hogs.

The third path in the development of agricultural production--organization of rear production bases in linked and southern regions of Siberia and the Far East--is also very important. Reliable transport communication with a territorial production complex or industrial center and sufficient resources for the production of additional agricultural products are the basic requirements on such bases.

For example, this is what can be said about the Upper Lena Territorial Production Complex. Kirenskiy Rayon in Irkutskaya Oblast can serve as its rear base. The harvests of grain, potatoes and open-ground vegetables are 25 to 32 percent higher there than the harvests in the oblast. The rayon has stable transport communication with the BAM zone on the Lena River and in the future it will be possible to build a railroad from Ust'-Kut to Kirensk for the development of forest resources. Furthermore, according to the data of the Irkutsk Department of the Republic State Planning Institute for Land Use Measures, it is possible to draw into agricultural turnover about 50,000 hectares of land, which is forest-covered, but fully suitable for development into arable and fodder land. Preliminary calculations show

the following: The average expenditures on the development of 1 hectare into arable land total up to 700 rubles and into fodder land, up to 600 rubles. The specialization of this territory in the development of beef cattle husbandry will make it possible to fully provide the population of the territorial production complex itself with meat, as well as to deliver part of it to other BAM sections.

The North Baikal Territorial Production Complex and the Udokan Industrial Center have more complex conditions for the development of agriculture. The Barguzin Basin (Barguzinsky and Kurumskiy rayons in the Buryatskaya ASSR) with transport communication on Lake Baikal can become their rear food base. However, production intensification is inconceivable there without overall land reclamation. The scale of this work is large. In particular, 12,000 hectares need major work on qualitative land improvement. According to preliminary calculations, the need for capital investments in the Barguzin Basin alone amounts to 430 or 450 million rubles. However, this will make it possible to increase the area of irrigated arable land to 43,000 hectares and of irrigated hayf. lds, to 41,000 hectares and to increase the production of meat, as compared with the present level, 7-fold, of milk, 4- or 5-fold, of vegetables, 16-fold and of potatoes, 17-fold. Such an increase in production will make it possible not only to supply the indicated products to the territorial production complex, but to deliver a significant part of these products to the population of the Udokan Industrial Center.

Amurskaya Oblast, provided the intensification of agricultural production is increased considerably and new land is developed in central and southern regions, by 1990 will be able to fully provide all the population in the oblast with food products and to deliver the necessary amount of grain, potatoes and vegetables to the zone of the Far-Eastern section of the Baikal Amur Trunk Line, primarily to the South Yakutia Territorial Production Complex.

Approximate expenditures on the development of rear food bases in Amurskaya Oblast total 80 to 100 million rubles.

In Khabarovskiy Kray, to provide the population of the Urgal'skiy and Komsomol'sk territorial production complexes with food products, it is best to place rear agricultural bases in the Yevreyskaya Autonomous Oblast. This is the only place in the country's east, where under relatively favorable soil and climatic conditions there are significant land resources suitable to be drawn into active agricultural turnover. Expenditures on the formation of a rear food base in the Yevreyskaya Autonomous Oblast will total 360 to 380 million rubles. In all, the establishment of the zone's rear bases will require no less than 1 billion rubles.

Great potentials for an increase in agricultural products in the zone lie in the intensification of reclamation work. The entire land stock of the eastern route of the BAM is more than 1 million hectares. About one-third--377,000 hectares--are located within the boundaries of existing farms. In addition to land drainage it is necessary to irrigate vegetable and fodder crops, early potatoes and pastures there. A total of 24,400 hectares of land, including 8,000 hectares in Amurskaya Oblast and 16,400 hectares in Khabarovskiy Kray, are to be irrigated with the use of hydraulic and wide-coverage sprinklers before the year 2000. Plans are made to put to use 2,000 hectares of new land in Amurskaya Oblast, almost 3,000 hectares in Khabarovskiy Kray and 2,700 hectares in the Yakutskaya ASSR during the 11th Five-Year Plan.

When implementing the program for the agricultural development of the zone, it is necessary to have in mind the following: All work will have to be done under conditions of an acute shortage of labor resources. This means that it is necessary to pay special attention to social and domestic problems, as well as problems of moral and material incentives for labor.

Furthermore, to enlist and retain young people in rural areas, it is advisable to organize a network of rural vocational and technical schools for training widely specialized machine operators, operators in mechanical milking, vegetable growers and workers in other specialties. With due regard for the need of production thought should also be given to vocational guidance for secondary schools in the BAM zone so that most graduates could find jobs in their specialty.

A successful solution of the mentioned problems will make it possible to produce a significant quantity of agricultural produce near places of consumption and will provide a perceptible economic effect. The decisions of the July (1978) Plenum and the draft of the decree of the CPSU Central Committee for the 26th CPSU Congress "Basic Trends in the Economic and Social Development of the USSR for 1981-1985 and for the Period Until 1990" aim at this.

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REGIONAL DEVELOPMENT

GRAIN ELEVATOR CONSTRUCTION PROGRESS, PROBLEMS REVIEWED

Minsk SEL'SKAYA GAZETA in Russian 7 Jun 81 p 1

[Article: "Storage Facilities for the Crops"--For related article see JPRS 78560, 21 July 1981, No 1290 of this series pp 1-6, 14-16]

[Text] There is no more important task for the agricultural workers than that of developing a rich harvest. But there is another task that is of equal importance -- that of preserving the crops down to the last kernel and protecting them against losses and spoilage. Thus, in our republic, where the weather does not always favor the busy harvest campaign, serious attention is given to the construction of grain cleaning and drying complexes, mechanized threshing floors and grain and seed storehouses. This then is precisely the goal of the Decree of the Central Committee of the Communist Party of Belorussia and the BSSR Council of Ministers entitled "Additional Measures for Ensuring the Harvesting of the Crops and the Procurements of Agricultural Products and Feed During 1981 and the Successful Wintering of the Livestock During the 1981/82 Period."

A great amount of construction work was carried out throughout the republic during the past 5-10 years and at the present time a majority of the farms have fine drying stations and reliable silos at their disposal. There are entire rayons, for example, where the problems concerned with the drying, forced ventilation and storage of grain have been completely solved: Pinskiy, Volkovyskiy, Grodzenskiy, Molodetschnenskiy, Nesvizhskiy Rayons. Let us take Pinskiy Rayon. Here, on all of the farms, the mechanized threshing floors, drying stations and storehouses have for all practical purposes been prepared for accepting the new crops. The work will be organized in a manner such that the grain will be moved directly from the machines into KZS (grain cleaning and drying units) hoppers and thereafter onto conveyors which will carry it into the storehouses.

Many kolkhozes and sovkhozes are displaying a proprietary interest in making preparations to accept the new crops. Examples similar to the one set in Pinskaya Oblast are to be found in each district and in each rayon. There is still another factor worthy of interest. We are still encountering farm leaders who reason as follows: if the weather is hot, no problems are anticipated with regard to processing the grain and we will harvest that which has to be harvested. Thus, such leaders have still not placed in readiness either their drying stations or granaries, nor have they asphalted their sites. Such faulty reasoning is inappropriate.

The builders have become unreliable allies of the farmers in a number of areas. They have still not eliminated the bad habit of dragging out the turning over of

projects until the last day. If the plans call for several construction projects to be completed during the first 6 months, they are presented to the committee during the very last days of that period. No earlier. And indeed at this point they still need to be tested, imperfections must be corrected and they must be made ready for accepting the new crops.

During the first 6 months, Belmeshkolkhozstroy must place in operation 13 seed and grain storehouses of 30 called for in the annual plan. Unfortunately, not one had been prepared by the beginning of June. It will be fine if these granaries are delivered to the clients prior to the new crops being delivered. But what if they are not? Indeed the kolkhozes are relying upon these projects being turned over for operation.

A similar situation prevails with regard to the construction of vegetable and potato storehouses, mixed feed plants and shops for the production of dry feed mixtures. Two of the first should have been placed in operation by the end of the first 6 months, but as yet only one has been turned over -- the Minsk Oblmeshkolkhozstroy tried and the Vitebsk Oblmeshkolkhozstroy appeared to be in no hurry; the plans called for two mixed feed enterprises -- not one has been made ready.

A considerable amount of concern has been aroused regarding the construction of elevators. During the second quarter of this year, storage facilities for 42,200 tons must be placed in operation -- metal grain storehouses at Kletsk, Lepel', Slutsk and Iv'ye. These are construction projects of the BSSR Ministry of Procurements, the general contractor -- the Belorussian Construction-Installation Section of a trust of the All-Union Soyuzellevatorstroy Association. All of these projects were scheduled for last year, but the builders were unable to turn them over on a timely basis. The schedules were postponed to this year, but just as in the past the work tempo continues to be unsatisfactory. The fault lies in the fact that the trust is devoting very little attention to its own Belorussian SNU [Construction and Installation Administration] -- it has not been properly staffed with equipment or personnel and its production base leaves a great deal to be desired. And here is the result: the installation of technological equipment has still not been completed at Lepel' and at Kletsk -- the motor vehicle access roads and railroad spur tracks were not ready and the civic improvements had not been completed. As yet, the project at Slutsk is still not ready for delivery. But an especially alarming situation exists at Iv'ye in connection with the construction of a metal grain storehouse. A great amount of work remains here -- the foundations for the facilities must be completed and the grain receiving stations equipped.

At the present time, the general contractor has intensified somewhat the work tempo. Although the possibility exists that the projects at Slutsk, Kletsk and Lepel' may be completed on a timely basis, this cannot be said regarding the project at Iv'ye.

The client is understandably alarmed regarding the Ministry of Industrial Construction for the BSSR, which is erecting elevators at Osipovichi and Glubokoye. The Stroymekhanizatsiya Trust of the above-mentioned ministry is the general contractor here. The plans call for the project at Osipovichi, which will have a 77,000 ton capacity, to be turned over during the fourth quarter. However, the client, having profited from bitter experience, is not confident that the construction will be completed by the mentioned period. And there is good reason

for this: despite the fact that there is a great amount of work to be carried out, the sub-contracting organizations are working in a slow and disorganized manner.

Such sluggishness is also being displayed at projects scheduled to be placed in operation next year. This applies to the second construction project of Minpromstroy (Ministry of Industrial Construction) -- the elevator at Glubokoye. There can be no guarantee that this project will be turned over on a timely basis, since at the present time it is not being supplied adequately with precast reinforced concrete structures and, as a result, the plan for 4 months of the current year has been fulfilled by only one half.

Discussions have taken place between the ministries. Specific measures have been planned and schedules outlined. However, notwithstanding these actions, no improvements have as yet been noted in the work being performed by the construction organizations of Minpromstroy for the BSSR.

The Decree of the Central Committee of the Communist Party of Belorussia and the BSSR Council of Ministers clearly sets forth the tasks and obligations of each part with regard to harvesting the crops and procuring the agricultural products and feed this year. The appropriate ministries and departments, oblast and rayon committees and oblast and rayon executive committees must organize in an efficient manner the fulfillment of the measures planned, ensure successful preparations prior to the commencement of the harvest campaign and also the timely placing in operation of those projects required for agriculture.

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REGIONAL DEVELOPMENT

NEW METHODS OF GRAIN HARVESTING IN KAZAKHSTAN

Moscow PRAVDA in Russian 15 Sep 81 pp 1-2

[Article by Ye. Zaytsev, Northern Kazakhstan: "From the Field to the Elevator"]

[Text] This year the farmers of Kazakhstan have decided to sell the state 1 billion poods of grain, for the fourth time in the five-year plan. "I can see ahead of time that all of the Soviet people will greet this report with great satisfaction," said Comrade L. I. Brezhnev at the festivities in Alma-Ata. "I hope that you will fulfill these obligations with honor." The largest contribution to the Kazakh billion will be made by the grain farmers of the northern oblasts. Here harvesting is in full swing. Grains have been placed into windrows on over four-fifths of the area and half of the grain has been threshed.

Thousands of combines are working on a 24-hour basis in the fields of Northern Kazakhstan. The machine operators of the Yubileyny Sovkhoz of Northern Kazakhstan Oblast are harvesting grains on the last hectares. Paired links are threshing windrows in a single area. Progressive harvesting methods are widely used. Combines operate without ceasing, enabling machine operators to achieve a high labor productivity. Thus, the komsomol youth link of communist I. Kapinos has pledged to thresh 50,000 quintals of grain using five units. Twenty five thousand quintals have already been unloaded from the combine's bunkers.

The "threshing floor-elevator" conveyor is operating precisely in the enterprise. As soon as 500-600 tons of grain are dried and sorted, an order is given to the Peshkovskiy Elevator. The next day a column of large trucks arrives with trailers to haul away the grain.

"Previously enterprises employed various methods of harvesting and transporting grain," says the first secretary of the Sergeyevskiy Rayon party committee, Ye. Shaykin. "This year we are changing to more progressive methods. In utilizing the experience of Tselinograd workers we have introduced an hourly schedule for grain deliveries to elevators. These methods have been developed best in the Yubileyny Sovkhoz."

What is the essence of the new method?

The virgin lands enterprises have amassed a great deal of experience involving grain shipments. Still, every year at harvest time a succession of trains with trucks on their platforms move east. Such shipments are not inexpensive. In addition, truck drivers are paid travel allowances and part of the salary from the original place of work. It turns out that the trucks that are imported are priceless. Nevertheless they are brought here so that in a month's time they can be sent home in a fairly worn state. There is only one reason for this--in any enterprise during harvesting the weakest link is transportation.

Virgin lands farmers are constantly seeking ways to increase the effectiveness of utilizing trucks. Many progressive forms of shipping the harvest from the combine to the threshing floor or from the threshing floor to the elevator were born in the virgin lands or implemented there. Now the country is familiar with the method of moving grain from the field using the K-700 tractor with a coupled trailer. The first to utilize it were the machine operators of the test farm in the All-Union Scientific Research Institute of the Grain Industry.

We are standing in the middle of a 400-hectare wheat field with the director of the test farm, A. Seleznev. Over a dozen combines with pick-ups are moving in a circle. Units operate without ceasing although one sees no trucks, not counting the mobile shop which is located at the edge of the section. One involuntarily thinks that as soon as the bunkers are filled with grain the combines will stop. But not far from us is a clearing in the wheat where a train of linked trailers is located to which the combine moves, unloads in 1.5-2 minutes and continues on to pick up another windrow. The other units make the same trip. Soon a Kirovets with an empty tractor arrived, set it in line and picked up a loaded one to take to the threshing floor.

"This harvesting method," says A. Seleznev, "is a good one because it sharply increases the output of the combines and tractors and the productivity of labor."

The director mentions some figures. In the link system (three combines per enclosure) up to 1.5 hours are needed to unload grain with trucks per hectare; in the large-group method--47 minutes. It takes 40 minutes for a truck to move 1 ton of grain; it takes a Kirovets 3 minutes. Just as last year, 170 persons are involved in cutting and threshing windrows and each of them works over 150 hectares of fields.

One year ago in Shortandinskij Rayon large groups (15-17 units) utilized 29 percent of the combine fleet and threshed over one-third of the grain. Even more striking is the data on grain deliveries. One truck can ship 423 tons per season; one Kirovets--6,350 tons.

"Having studied the accumulated experience," says the first secretary of the Shortandinskij Rayon party committee, P. Golovach, "we recommended that it be introduced everywhere. The result of this was that whereas previously we had requested an additional 2,000 trucks, now we ask for only 500."

The brigade of V. Butyn of the Turgayskiy Sovkhoz-Technical School is skilfully utilizing the large-group method of harvesting with grain shipments by the Kirovets. The brigade only 15 people. The almost 5,000 hectares are harvested by 10

combines and four tractors with trailers deliver the grain to the threshing floor. This year the brigade is playing an experimental role. It has been strengthened with more powerful technology with the assumption that it will complete all of the work itself. The collective produced a good harvest and accepted increased obligations for the production and procurement of grain.

The experience of progressive workers is becoming more and more widespread. One year ago in Sovetskiy Rayon of Northern Kazakhstan Oblast three combine-trailer brigades were organized; now there are over 240. It is true that there is one shortcoming in this method of grain transfer--the large truck stands on the road and the Belarus' tractor pulls the trailers to it. In the 50 Let VLKSM Sovkhoz the intermediate link of the wheeled tractor was eliminated last year and the trucks with trailers were placed on the side of the field and in specially-designated places in the field. Soon other sovkhozes began to utilize this innovation. As a result, in places where the combine-trailer method was utilized, one truck covered 430 hectares of harvesting area, whereas in other regions where the old method was used one truck covered 170 hectares.

These examples convincingly demonstrate that the transfer of grain from combines using powerful transport is noticeably effective. Still, the new method is not being used everywhere. In Tselinogradskaya Oblast it is used by only 116 harvesting complexes. What is the reason for this? First, there is a shortage of cadres. On the virgin lands the tractor operator is also the combine operator. A significant number work on combines during harvesting. In addition, the Kirovets is used for late-fall plowing, since about 3 million hectares need to be plowed. The main problem is that there is a shortage of trailers. The oblast's enterprises have an average of one trailer per three Kirovets tractors. Specialists have calculated that if we acquired two trailers per tractor it would be possible to change to the large-group method of harvesting with a centralized shipment of grain. However, at the present time it is much more difficult to receive a trailer than, for example, five trucks.

In Tselinogradskaya, Kokchetavskaya and Northern Kazakhstan oblasts hourly schedules for grain deliveries to reception points are widespread. One of the first to utilize them was the collective of the Dzhaltyrskiy Elevator. When we approached the elevator it seemed that on that day grain was not being delivered there. Nevertheless, the deputy chairman of the Astrakhanskiy Rayon executive committee, A. Yavorskiy, had said that grain procurement is in full swing.

"Strictly according to schedule," confirmed the director of the elevator, B. Ibrayev. "During the day we receive up to 60 percent of the grain and the rest arrives at night."

We spent several hours at the elevator and no line ever formed there during this time. It took only 30 minutes to unload a tractor-trailer unit with four trailers, which was brought from the Obratsovyy Sovkhoz by the well-known driver S. Balyan. P. Kolos brings grain from the Put' k Kommunizmu Sovkhoz in another tractor-trailer unit. Each of them alone produced all the grain earmarked for sales to the state last year. Today again the leading drivers have decided to send 10,000 tons of grain each to the elevator, which is a very high indicator. Following the recommendation of S. Balyan the enterprise even reorganized the grain threshing floor in order to expedite the loading of tractor-trailer units.

The most important aspect of organizing work according to hourly schedules is the centralization of truck transportation. It is all concentrated at the elevator and is subordinate to the operations staff. Radio sets and telephones have been set up here so that there are stable communications with all threshing floors. In the morning the dispatcher accepts requisitions and sends the mobile laboratory for grain analysis wherever necessary. In the evening the dispatcher travels to Tselinograd, where there are computers in the motor transport administration. An hour or so later, depending upon the computer load, he receives data on the optimal utilization of transport. Even the speed and loading time of trucks of various types are considered. It is the staff's duty to efficiently bring orders down to enterprises and drivers and then to follow through on the fulfillment of the schedule.

The introduction of hourly schedules has enabled us to curtail idleness in trucks during unloading at the elevator to 15-20 minutes as compared with the usual 32 minutes. Expenses for moving 1 ton of grain decreased from 1.1 to 0.4 rubles, and the total economic effectiveness comprised almost 108,000 rubles. Already today all large elevators in the oblast are operating according to the new method.

In Tselinogradskaya Oblast about 200 columns and brigades have been created for the hourly delivery of grain to 23 elevators. Tractor-trailer units will transport a third of the grain. Progressive methods of harvesting and shipping grain have enabled us to curtail the number of trucks that are recruited for harvesting by about one-third as compared with last year. Nevertheless, about 7,000 trucks were needed in the oblast this year. We can cut this number down if we create more tractor-trailer units.

"This is undoubtedly so," agrees the director of the Tselinogradskaya Oblast Motor Vehicle Administration, I. Yason. "But industry supplies very few trailers. We acquire tractor trailers by various means if they cannot be repaired in enterprises. Somehow we repair them and use them to ship out grain. Designers have a debt to pay to virgin-lands farmers--a large trailer still has not been developed and those that are undergoing testing now can carry fewer than 10 tons.

Such complaints were heard from the directors of motor-vehicle enterprises in other oblasts of Northern Kazakhstan. Of course virgin lands farmers have other problems, the solution to which will enable us to accelerate the harvesting and transport of grain. Among these is supplying enterprises with large-capacity trailers. Their supply will enable us to increase the productivity of combines. Newer transport means will be necessary for moving the harvest to elevators. Only in this way will it be possible to strengthen the weak links of the harvesting conveyor. Interested ministries, departments and planning organs must turn their attention toward this problem.

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REGIONAL DEVELOPMENT

GRAIN STOREHOUSES PLANNED

Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 30 Jan 81 p 2

[Article: "Storehouses for Grain"]

[Text] Grain is our most important treasure. Soviet Kazakhstan has rightfully become the country's large granary. Over 25 million hectares are sown in grains each year. The crops are growing. A billion poods of grain is becoming the norm for the republic. A rich and stable harvest is facilitated by the movement of rural workers toward high-quality farming, which is developing broadly in Kustanayskaya, Severo-Kazakhstanskaya, Teelinogradskaya, Kokchetavskaya, Turgayskaya and other oblasts. It is one of the basic forms of competition among grain farmers for the overall increase in grain production. In the republic there are already about 100 sovkhozes and kolkhozes and over 700 departments and brigades which have been awarded the title, "Collective of High-Quality Farming." During the new five-year plan there will be even more of them. But a great deal of skill, strength and persistence in very many people is necessary in order to raise a rich harvest.

Another thing is important here--to place grain in dependable storage facilities in the fall. Our government is giving a great deal of attention to the construction of storehouses and grain-drying enterprises. Large-capacity elevators equipped with the most modern equipment have been constructed in grain regions and each enterprise has a mechanized threshing floor. Again during the 11th Five-Year Plan the material base for the partial processing and storage of grain will be developed and strengthened everywhere. The draft of the CPSU Central Committee to the 26th party congress, "Basic Directions of Economic and Social Development in the USSR in 1981-1985 and in the Period to 1990," calls for the introduction into operation of grain elevators with a total capacity of 20 million tons, primarily in the main grain regions. Grain-drying capacities will be increased at an accelerated pace in regions where sunflowers, corn and rice are cultivated. In this we see reflected the true concern of the party regarding grain, which is the source of everything.

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REGIONAL DEVELOPMENT

PROBLEMS IN ELEVATOR CONSTRUCTION

Moscow EKONOMICHESKAYA GAZETA in Russian No 51, Dec 79 p 19

[Article by Ye. Kozlov, Kazakh SSR: "It Could Not Be Done on Time..."]

[Text] In 1979 the grain farmers of Kazakhstan produced a record harvest and sold the state 1.26 million poods of grain. Procurers also worked well, but their work could have been more successful if the construction workers had not let them down. The republic's ministry of construction tolerated serious lags in the construction and start of elevators and mixed-fodder plants. Many of them were supposed to receive grain from the new harvest for processing and storage.

This year the republic had planned ~~on~~ the introduction into operation of elevator capacities of almost 430,000 tons, but during 10 months only those for 99,000 tons were actually introduced. The introduction of a unit of the Tselinograd Elevator with a capacity of 18,000 tons was planned for the second quarter but still has not been introduced into operation today. Even in operational elevators of other oblasts work is lagging behind greatly. Thus, over a period of 10 months the annual plan for construction and installation work at the Karatogayskiy Elevator in Aktyubinskaya Oblast was fulfilled by only 60 percent.

An alarming situation has developed with the construction of the Peshkovskiy Elevator in Kustanayskaya Oblast. Here the volume of construction and installation work in the operational complex was completed by only 73 percent. This year two silage units with a total capacity of 36,000 tons were put into operation, but it is threatened that work will not be completed on another unit with a capacity of 18,000 tons. Suffice it to say that for this unit work to lay the concrete foundation has just begun and the summer months that are favorable for such work have been allowed to slip away.

What is the reason for this? The directors of the republic's ministry of construction blame the shortage of cement first. This is true, but builders themselves are also at fault in a great many things. Let us take the Alma-Atinskay Combine of Grain Products as an example. This year a silo with a capacity of 9,300 tons must be put into operation there, but the annual volume of construction-installation work was fulfilled by only one-third.

Here is another example. At the Predgornaya Station of Eastern Kazakhstan Oblast the introduction of elevator capacities for 62,000 tons was planned for the

fourth quarter. The republic's ministry of agricultural construction decided to introduce these capacities into operation during the third quarter in order to curtail the lags that have been tolerated in other elevators. The reception committee pointed out a number of inadequacies that had to be eliminated immediately. But the Number 24 Vostoksel'stroy [Eastern agricultural construction trust] (director G. Shneyder) did not do this and the facility was not put into operation on schedule. Here one cannot complain about the shortage of cement.

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REGIONAL DEVELOPMENT

LACK OF PREPAREDNESS OF GRAIN ELEVATORS DEcriED

Preparations Incomplete

Moscow EKONOMICHESKAYA GAZETA in Russian No 34, Aug 80 p 19

[Article by the raid brigade of EKONOMICHESKAYA GAZETA and the oblast newspaper TSELINOGRADSKAYA PRAVDA: "The Readiness of Grain Storehouses"]

[Text] An adequate harvest is maturing on the grain fields of the virgin lands near the Isha. The oblast's enterprises are completing the adjustment of combines. Procurers as well as grain farmers will have to pass a strenuous test. It is the aim of procurers to organize reception operations smoothly.

All grain-reception enterprises in the oblast basically completed the preparation of the material-technical base by 15 July. As a result of renovating technical flow lines and replacing antiquated equipment with more efficient, they are now able to receive over 150,000 tons of grain and dry about 90,000 tons. One year ago these figures were 140,000 and 80,000 tons. Of the 359 truck unloaders, 154 (as compared to 115 last year) have been reequipped to unload KamAZes [motor vehicles made in the Kamskiy Motor Vehicle Plant].

Among the innovations is the MOK-1 unit for the mechanical washing off of gluten. It successfully passed tests in the grain-reception point of Shortandinskiy and Astrakhanskiy rayons. Specialists are unanimous in their reports--the MOK-1 enables us to determine grain quality more precisely, eases the labor of people and improves productivity and production quality. In the course of the current procurement campaign the units must be used in all procurement enterprises.

The initiator of oblast competition for the timely and dependable preparation and reception of grain from the new harvest was the collective of the Krasnoznamenskiy Elevator (director Yu. Ekhval'd). During the last harvest it received 262,000 tons of virgin-lands grain, of which 95 percent was wheat of strong, hard and valuable varieties. Now the regular procurement campaign is nearing. What kinds of changes have occurred at the elevator in the past year? Its reception capacity has grown by 6,000 tons of grain per day. Four 60-ton scales have been put into operation. New aspiration networks have been installed and old ones reconstructed. It is also very important that workers there were able to introduce a system of planning and preventive repairs. It curtails idleness due to premature wearing away of equipment, breakage or accidents, improves quality and decreases the cost of repair work.

Grain procurers are striving to utilize existing possibilities with maximum effectiveness. For example, last year the reception of grain according to hourly schedules calculated by electronic computers yielded excellent results. At that time they were enforced in 17 enterprises and now the figure has increased to 23. It has been estimated that operations on a 24-hour basis decrease the need for truck transport by almost one-third, increase the reception capability of elevators. Thus, schedules will continue to be used in the future.

The oblast administration of grain products (director R. Kakimov) and the Tselinograd division of the railroad (director A. Kasymov) are already realizing a joint plan of measures. This year the unloading of last year's grain reserves is proceeding better than in previous years. They have been removed from the Yerkenshilikskaya Number 100 Grain-Reception Base (director Zh. Arkhabayev) and from the Krasnoznamenskiy Elevator ahead of schedule. Transportation workers provided above-plan supplies of empty trains at the stations of Atbasar, Makinka, Shortandy, and Sary-Oba. The collectives of the station and the grain-reception enterprise are again concluding contracts dealing with the mutual obligations of both parties.

This year new elevator capacities totalling 80,900 tons must be put into operation in the oblast. Most of the increase is planned through the construction of the Akkul'skiy Elevator, the total capacity of which will be 196,900 tons. This year two remaining silos will be put into operation, one for 31,300 tons during the third quarter and another for the same amount during the fourth. In March construction workers submitted another silo for operation, but operations personnel still has not been able to put it into working order. The general contractor--the construction-installation train Number 115 of the Tselinogradlevatorstroy Trust [Tselinograd Elevator and Mill Construction Trust] (director B. Gankevich)--left the unit with many shortcomings. There are even some cases of outright defects. The asphalt covering inside the reception facility violates technical requirements. When the structure was completed the builders presented the directors of the Akkul'skiy Elevator with guarantees that promised to eliminate shortcomings in the shortest time possible. Today, on the eve of the harvest, operations personnel with the guarantee in hand are beating on the doors of the trust, but to no avail.

We are concerned by the fact that cleaning installations are not being put in at the Akkul'skiy Elevator. The total volume of construction-installation work for cleaning installations will assimilate 307,800 rubles, but as of today only 4,800 rubles have been assimilated.

There is a problem with the operation of metal capacities for 15,300 tons at the Adyrskiy Elevator. This structure is being constructed by a special PMK [Mobile mechanized column] (director G. Volkov) from the all-union Soyuzlevatorstroy Trust [elevator construction trust]. In order to put the structure into operation during the fourth quarter it is essential to assimilate 552,000 rubles in construction and installation work, but only 47,000 rubles have been assimilated.

Meanwhile, time does not wait. It is essential to correct the tolerated shortcomings in order to aid procurers in greeting the harvesting period well-armed during the final year of the five-year plan.

Shortcomings Corrected

Moscow EKONOMICHESKAYA GAZETA in Russian No 45, Oct 80 p 18

[Response of A. Aldunin, director of Glavlevatormel'stroy of the Kazakh SSR Ministry of Rural Construction to the article "The Readiness of Grain Storehouses" in EKONOMICHESKAYA GAZETA, No 34: "Our Answer"]

[Text] The criticism of poor organizational work in the construction of the Akkul'skiy Elevator in Tselinogradskaya Oblast found in the article was totally justified. At the present time the Tselinogradelevatormel'stroy Number 1 Trust has taken measures to eliminate the tolerated shortcomings. The question of constructing cleaning facilities has been solved. They will be built and put into operation in December of the current year at the same time that the last silo, Number 6 with a capacity of 31,300 tons, is put into operation. The deputy director of the trust, Yu. Buchinskiy, will be responsible for this work.

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REGIONAL DEVELOPMENT

UNSATISFACTORY ELEVATOR CONSTRUCTION DECRIED

Construction Problems

Moscow EKONOMICHESKAYA GAZETA in Russian No 35, Aug 80 p 18

[Article by raid brigade from EKONOMICHESKAYA GAZETA and the Ural'skaya Oblast newspaper PREDSTAVL'YE: "Quiet at the Operational Site"]

[Text] One of the largest elevators in Ural'skaya Oblast with its capacity of 143,000 tons is being constructed at the Peremetnaya Station. Three silos and a tower with a total capacity of 89,000 tons are to be put into operation during the fourth quarter of this year. What is the situation at the construction site? We must admit that it is unsatisfactory. The general contractor--the Zapadelevatormel'stroy Trust [Western elevator and mill construction trust] of the Kazakh SSR Ministry of Rural Construction--is not keeping up with the plan for construction and installation work.

Trust directors (director V. Lysenko, senior engineer K. Karashanov) explain that the problem is a shortage of workers. It is true that the structure needs 250-300 workers each day when actually there are only 200. It is also true that recently the number of workers at the site has increased somewhat. A construction detachment from Belarusia has come to the aid of the construction workers and during the summer upper-level students from the rayon center and others come there to work. Those who will service the elevator after it is put into operation have also come there.

Still conditions are bad at the site. Why? If there is a shortage of workers, those that are there must be utilized more efficiently, especially in the operational complex. Nevertheless, the trust's directors have concentrated many people in non-operational or even non-plan structures.

This inefficient distribution of labor leads to lamentable results. Up to 10 structures of the operational complex are just beginning to be constructed, or construction is proceeding very slowly. Whereas workers' facilities and three silos have been constructed and equipment is now being installed in them, foundation pits for truck and railroad scales have just recently been dug out. A great deal of work remains in the construction of the administrative building, intra-site networks, the firehouse, reservoir, etc.

Installation work is being held back in some structures of the operational complex. This is a result of the absence of equipment, cables and other things. Kazagotonab (Kazakh procurement and supply association) of the republic's ministry of procurement did not deliver armor-plated and telephone cables and some of the equipment for the auxiliary structure.

The railroad branch is being laid slowly. The main reason for this is the absence of crossties. While complaining about this, the Aktyubinsktransstroy (Aktyubinsk transportation construction trust) is not working, although it can and must make the road bed and perform other work. The road construction workers from the Number 9 bridge-construction trust have not yet begun the construction of the road from the settlement to the elevator or the laying-out of the area surrounding the elevator.

All of these errors are having a negative effect on the construction schedule of the elevator. If they are eliminated it would be possible not only to put the planned capacities into operation on schedule but also to additionally construct and begin operating another silo with a capacity of 27,000 tons.

Inadequacies Corrected

Moscow EKONOMICHESKAYA GAZETA in Russian No 43, Oct 80 p 18

(Response of A. Aldumin, director of the Glavlevatormel'stroy of the Kazakh SSR Ministry of Rural Construction to the article, "Quiet at the Operational Site" in EKONOMICHESKAYA GAZETA, No 35: "Our Answer")

(Text) The criticism regarding the unsatisfactory management of construction and installation work at the elevator site of the Peremetnaya Station, Ural'skaya Oblast, is justified. The Zapadelevatormel'stroy Trust did not complete its 8-month plan for construction and installation work. Work was not performed in all sections of the complex. A staff meeting was held at the site to thoroughly examine conditions at the operational complex. A schedule of construction-installation work was developed and confirmed by the deputy minister of rural construction of the republic. The schedule determines the work time frame for each structure. Four additional mobile mechanized columns have been recruited.

At the present time equipment is being installed and finishing work is being carried out in the main structures of the elevator--the workers' building, the silo and the grain dryer. Measures are being taken to introduce access roads and energy supplies for the elevator. In accordance with the established schedule, in November of the current year all structures at the elevator will be given over to the state commission.

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REGIONAL DEVELOPMENT

HIGH QUALITY GOAL FOR PROCUREMENT STRUCTURES

Plans, Problems in Elevator Construction

Moscow EKONOMICHESKAYA GAZETA in Russian No 30, Jul 80 p 19

[Article by K. N. Musin, minister of Rural Construction of the Kazakh SSR: "High Quality for Procurement Structures"]

[Text] During the last decade grain yield has increased noticeably in Kazakhstan. During the four past years of the five-year plan the republic sold the state a billion pounds of grain three times. Naturally the increased volume of grain procurement has required the construction of new granaries and processing enterprises. With each new five-year plan the scale at which the structure is equipped increases. Primarily modern, highly mechanized enterprises are being constructed.

Thus, by the end of the present five-year plan elevator capacities for 2,884,000 tons will have been introduced. This is 557,000 tons more than during the Ninth Five-Year Plan. During the current year alone it is planned to put into operation elevators with a total capacity of 690,000 tons, mills with a productivity of 845 tons of flour per day, grain dryers with a capacity of 432 tons per hour and mechanized grain storage facilities with a total capacity of 38,500 tons.

Together with the Kazakh SSR Ministry of Procurement we developed a complex of measures in order to put into operation elevators with a capacity of 30,000 tons as well as other capacities and structures prior to the beginning of harvesting operations. This obligation is now being fulfilled, the pace of introducing grain storehouses into operation has grown threefold in comparison to last year and is significantly greater than that established in the plan.

While having concern for the pace of growth of the capacities that are being introduced, we are also working on improving the quality of grain storehouses. Kazakhstan was one of the first regions in the country to utilize some of the innovations that improve the technical and technological features of elevators and that accelerate their construction. Among these innovations is the utilization of standardized volumetric components, pre-stressed structural members, etc.

Nevertheless, the sectional elevators that are being constructed are not devoid of some shortcomings. The main one is poor sealing, which results in the penetration of atmospheric humidity into the elevator through the horizontal and vertical

joints and in places where there are bolt ties of external elements. We worked on eliminating this problem for a long time and have now found the solution. In those places where there are over 560 millimeters of precipitation per year, specifically in Northern Kazakhstan, Kustanayskaya and Kokchetavskaya oblasts it is planned to introduce design protection of joints in the outer walls of silos.

In addition to solving serious design, technological and technical problems we attach great importance to controlling quality during the construction process. A special inspectorate was created in 1977 in the ministry precisely for this purpose. It controls the quality of the structures being constructed and the articles being manufactured by industrial enterprises. The inspectorate makes regular on-site inspections. It discovers errors but also tries to foresee and avoid them. The workers of the inspectorate develop a complex of measures for each problem and offer the construction organization complex measures for eliminating them and preventing them in the future.

At the same time we use economic measures to affect the schedule and quality of construction. For example, brigades that are working by contracts are given bonuses for each percent of work time that is curtailed. The amount of time also depends on the quality of construction. In evaluating the work that has been completed, an 'excellent' while curtailing work schedules is rewarded by up to 3 percent of the total contract wages; an evaluation of good--up to 2 percent; and an evaluation of satisfactory--0.5 percent. Here is how this is reflected in wages. In the Tselinogradelevatormel'stroy trust the Number 1 brigade of V. Nosik completed the construction of a silo ahead of schedule during 5 months of the current year and received an additional 2,000 rubles. This was awarded to it for good quality work. In the Yuzhelevatormel'stroy Trust [Southern elevator and mill construction trust] last year the brigade of L. Vitkovskiy received 25,400 rubles for contract work curtailing the construction schedule of the Zholomanskiy Elevator and for high-quality work.

The measures that we have taken have enabled us to put 90 percent of our elevators into operation with a rating of good or excellent. Of course it cannot be said that there are no shortcomings in this. There are problems, but they are gradually decreasing.

The quality of structures depends to a certain extent on the durability of the equipment, its completeness and on adherence to its delivery schedule. But at the present time these problems have not been solved. The technical level and the quality of designs and manufacture of equipment for structures earmarked to store and process grain are lagging behind modern needs to a significant extent, including in operational dependability as well as installation preparedness. Examples of such equipment are the grain drying unit manufactured by the Biyskprodmash [Biysk food machinery plant] association, bucket elevators of various manufacturers in the machine construction plants of Karlovka, Kursk, Gryaz', Kurgan, Orenburg and Blagoveshchensk, rack bolts and battery units from the Kurganskiy and Gryazinskii plants of the Soyuzprolevatormel'mash association.

Of special concern is the completeness of large operational elevator complexes in the stations of Zholoman, Zhaksy and Peremetnoye. Here there has been an under-delivery of a great deal of technological and electrotechnical equipment and dozens

of kilometers of cable and wire products. Moreover, not all of the basic equipment has yet arrived, including pivotal distribution pipes, separators, electrical panels, cabinets for temperature measurement, etc. Continued lags in the delivery of equipment can result in the halt of operational starts of the most important structures.

The untimely equipping of structures is a considerable barrier to installation work using progressive, rapid methods. In order to correct the situation it is essential to conclude the equipping of structures with basic equipment prior to beginning installation work in order to avoid an assault on various structures simultaneously at the end of the year. For this reason we propose the unloading of some of the basic equipment in the year preceding the operational start of the structure. In our opinion it is then necessary to introduce model schedules for equipment deliveries in accordance with the technical installation order and to make the schedules normative documents. This will undoubtedly also encourage the rhythmic and quality construction of elevators.

Shortcomings Corrected

Moscow EKONOMICHESKAYA GAZETA in Russian No 39, Sep 80 p 19

[Response of Yu. Kovalev, USSR Deputy Minister of Procurement, to the article "High Quality For Procurement Structures," No 30 of the daily: "Our Answer"]

[Text] The article correctly notes that some of the technological and electro-technical equipment was not delivered to the operational structures at the stations of Zholoman, Zhaksy and Peremetnoye of the Kazakh SSR. The article in EKONOMICHESKAYA GAZETA was examined and measures were taken to accelerate the shipment of equipment. Centrally delivered equipment has been fully unloaded for the elevator at Zholoman Station; deliveries have to be made to four sites at the elevator at Zhaksy Station; and the equipment for the Peremetnoye elevator is in the process of being unloaded.

The Kazakh SSR Ministry of Procurement has been given orders to take immediate action to quickly complete the delivery of the necessary equipment and electro-technical and cable articles. Permanent controls over their delivery have been established. With the aim of improving the technical level and quality of manufactured bucket elevators, rack bolts and battery units and other type of equipment the USSR Ministry of Procurement is realizing the construction of new and renovation of existing machine construction plants, equipping them with the newest types of machines and introducing progressive technological processes there.

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REGIONAL DEVELOPMENT

BRIEFS

READINESS OF STORAGE FACILITIES--The entire harvest that was cultivated by the farmers of Eastern Kazakhstan Oblast will be placed in dependable storage facilities. The Predgornenskiy Elevator, where new large capacities for 90,000 tons were put into operation, will aid in this. Grain storage facilities have increased in Kustanayskaya, Tselinogradskaya, Semipalatinskaya and a number of other oblasts. They are primarily earmarked for the grain of strong and valuable wheat varieties, the production of which has increased significantly in Kazakhstan since the beginning of the five-year plan. Grain-reception enterprises are completing the final preparatory work for grain reception. Most attention is given to increasing the effectiveness of using units and equipment. Roads and access ways have been repaired, additional unloading equipment was installed in order to ensure grain deliveries on a 24-hour basis. The precise interrelationship of all participants in the transportation-procurement conveyor will be secured by points of the central dispatcher's administration which have been created in most large elevators and reception enterprises [TASS]. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 32, Aug 80 p 19] 8228

NEW GRAIN STORAGE FACILITIES--Kustanayskaya Oblast--The total capacity of grain-storage facilities in Kustanayskaya Oblast has been increased to almost 4 million tons. Recently the Peshkovskiy Elevator with a capacity of 150,000 tons was put into operation. It will now be possible to receive up to 6,000 tons of grain. Forty five of 55 grain reception enterprises in the oblast are fully ready for harvesting. [R. Mirgorodskiy] [Text] [Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 16 Jul 80 p 1] 8228

SKYSCRAPERS FOR GRAIN--Alma-Ata--Peshkovskiy Elevator in the Kustanay steppe is now ready to receive the harvest from the wheat fields that number in the tens of thousands of hectares. Construction workers completed the ferroconcrete structure two months ahead of schedule. As a result the total capacity of the storage facility now exceeds 130,000 tons. The high level of industrialization in operations aided in saving time. The basic elements of the huge structure were made in plant shops and then put together at the site. It has been decided to complete the construction of still another ferroconcrete facility as soon as possible in order to load it with grain from the new harvest as well. Since the beginning of the year Kazakhstan construction workers have put storehouses into operation with a total capacity of over 60,000 tons, or double the amount planned. In the time remaining until mass harvesting in the main grain regions of the republic it is planned to open new facilities for storing another 85,000 tons of grain. [Text] [Moscow STROITEL'NAYA GAZETA in Russian 8 Jul 79 p 1] 8228

READINESS TO RECEIVE GRAIN--Not only farmers, but procurers as well are greatly concerned about this year's grain. It is the job of the workers of the grain-procurement points in the country to receive the harvest from kolkhozes and sovkhozes on schedule and to place it in good storage facilities. Preparations for the new harvest are being made in Kazakhstan. In the republic over four-fifths of all storehouses, dryers, most unloading equipment, transporters and cleaning machines have been subject to preventive maintenance. The capacities of elevators have been expanded by several hundred thousand tons. Large elevator complexes have been put into operation in Tselinogradskaya, Kustanayskaya, Aktyubinskaya and Dzhambulskaya oblasts. The last unit in the Dzhambulskiy Elevator will begin to receive grain 1 year ahead of schedule. A new storage facility with a capacity of 18,000 tons was put into operation. The elevator complex that is being constructed near the irrigated oases in the foothills of the western Tyan'-Shan' will store over 150,000 tons of grain. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 28, Jul 79 p 18] 8228

CSO: 1824/337

AGRO-ECONOMICS AND ORGANIZATION

ORGANIZATIONAL AID PROPOSED FOR PRIVATE SECTOR DEVELOPMENT

Moscow EKONOMICHESKAYA GAZETA in Russian No 25, Jun 81 p 10

Article by G. Shmelev, doctor of economic sciences: "Private Subsidiary Sector"⁷

⁷Text. In his report at the 26th CPSU Congress L. I. Brezhnev noted the following: "Kolkhozes and sovkhozes were and remain the basis for socialist agriculture. However, this does not mean at all that the capabilities of private subsidiary farms can be ignored. Experience indicates that such farms can be a great help in the production of meat, milk and some other products. The orchards, gardens, poultry and livestock belonging to workers are part of our common wealth."

Essence and Role

The private subsidiary sector has a socialist nature. It is determined by the fact that, first, it is managed by workers in socialist collectivized production, whose basic source of income is from work in state and cooperative enterprises--kolkhoz members, workers and employees--and that it is based on their personal labor and the labor of their family members.

Second, the private subsidiary sector is connected by reproduction ties with collectivized production and is its necessary supplement in the establishment of the country's food stock. In 1980 private subsidiary farms accounted for approximately 31 percent of the meat, 30 percent of the milk, 32 percent of the eggs, 35 percent of the vegetables, 64 percent of the potatoes and 58 percent of the fruits and berries (without citrus fruit) of the total volume of production in the country.

The public sector of kolkhozes and sovkhozes plays a definite role in the development of agricultural production. Therefore, one cannot overestimate the importance of the private subsidiary sector and consider it an independent sector in the agrarian economy, not subsidiary, dependent production.

The underestimate in the past of the private subsidiary sector, as well as an exaggeration of its role, despite a kind of diametrically opposite approach, in essence, has the same basis--disregard for direct and indirect reproduction ties between it and the public sector.

For example, this is how the fact that approximately 1.5 percent of the agricultural land is now utilized in the private subsidiary sector is evaluated from various positions. What is 1.5 percent, say those who underestimate the role of

the private subsidiary sector. This is a small amount. If the public production of kolkhozes and sovkhozes took upon its shoulders the concern for 98.5 percent of the agricultural land, can it not add the rest to this burden, especially at the present level of development of productive forces of agriculture?

How simple everything is! There is disregard for complex reproduction ties and interrelationships in the social and economic structure of agriculture.

On the other hand, some people are inclined to overestimate the importance of private subsidiary farms and the labor productivity on them, relating the entire volume of output produced by them to the 1.5 percent of land assigned for use by private plots. However, it is necessary to differentiate the legal relations of land use from economic relations and from the actual amount of land making it possible to ensure the present volume of production on these farms.

The private subsidiary sector can be correctly evaluated only with due regard for its many-sided relations with public production. For example, the farms of this sector are provided with fodder from an area much--several times--bigger than the area of private plots. It includes both hayfield and pasture land used for privately owned livestock and areas necessary for the production of fodder (basically grain) sold and distributed according to labor from the public sector. For example, in 1979 kolkhozes and sovkhozes allocated 13.5 percent of the total area of natural hayfields to families of kolkhoz members, workers and employees for hay mowing. An analogy with fattening farms, which produce a considerable quantity of animal products with purchased fodder, suggests itself here.

Furthermore, the private subsidiary sector obtains a large quantity of young cattle, hogs and poultry from the public sector. In 1980 alone 0.9 million head of cattle, about 15 million hoglings and 570 million chicks were sold to the population. In turn, the population annually sells millions of head of cattle to kolkhozes and sovkhozes for further raising and fattening.

A division of labor manifested in differences in the production structure exists between the private subsidiary sector and public production. The public sector fully provides the country with grain and industrial crops. The bulk of the potatoes, fruits, berries, honey, green crops and rabbit meat is produced in the private subsidiary sector.

The division of labor between the public sector and the private sector is manifested especially clearly when production is analyzed in regional terms.

Thus, the private subsidiary sector is not only connected with the public sector by reproduction ties, but it supplements its sectorial structure. The private subsidiary sector activates important labor and material resources, by means of which the present level of food supply for the population is attained. Here there are also significant potentials for an increase in agricultural production with relatively lower material and financial expenditures on the part of society.

State support for the private subsidiary sector is due not only to its economic significance, but also to the fact that in its social essence it represents part of socialist agriculture and the relations in connection with its management form part of the system of socialist production relations.

The attempts to consider our kolkhozes and sovkhozes--farms producing products for our whole society--socialist and farms producing the same products by the same workers and for the same workers and providing a significant part of the food for all society some remnants of private farms falling out of the general system of socialist agriculture are an obvious theoretical inconsistency. In the subject and object of management, in socioeconomic functions and goals and in the closeness and nature of reproduction ties private subsidiary farms belong to socialist production.

Contractual Relations

The decree of the CPSU Central Committee and the USSR Council of Ministers "On Additional Measures To Increase the Production of Agricultural Produce on the Private Subsidiary Farms of Citizens" adopted in 1981 envisages the development of contractual relations between kolkhozes, sovkhozes, interfarm organizations and consumer cooperatives, on the one hand, and the population, on the other, concerning the fattening of livestock and poultry and the delivery of milk. Such contracts have already been concluded in the country's individual regions and will become even more widespread subsequently (standard contracts were published in Nos 17, 18 and 19 of EKONOMIC'ESKAYA GAZETA of this year).

The development of these contractual relations will signify an expansion of inter-farm cooperation not between large agricultural enterprises, but between the public and the private sector. Such cooperation makes it possible to greatly raise the level of collectivization of production and labor in the private subsidiary sector, while retaining private ownership of the used means of production. These means remaining in private ownership begin to "work" for the public sector. Hence labor, not changing the place of application, also joins the public sector.

For example, about 25,000 head of cattle, 14,000 hogs and 220,000 head of poultry were fattened on the basis of mutually advantageous cooperation with kolkhozes and sovkhozes in rural yards of Odesskaya Oblast in 1980. A total of 5,000 tons of meat were produced there on the basis of contracts. According to preliminary calculations, more than 8,000 tons of meat will be obtained in 1981.

There is valuable experience in the development of contractual relations with the population in L'vovskaya Oblast. For several years the Kolkhoz imeni Chapayev in Brodovskiy Rayon has bought young stock from rural residents and left it on farms for further raising on a contractual basis. A total of 471 head with an average (live) weight of 405 kg were taken off fattening on the basis of contracts on the kolkhoz in 1977-1980. The calculated production cost of 1 quintal is 160 rubles and profitability, about 45 percent.

More than 45,000 contracts for the fattening of livestock and 127,000 contracts for its delivery with subsequent additional fattening on farms were concluded with the population in this oblast in 1981. The work done on an expansion of relations with the population's farms made it possible to reduce the slaughter of livestock during the milking period, to more fully utilize food waste, to save funds and construction materials for places for 60,000 animals and to draw additional labor resources into productive ishor.

There are great potentials for production growth on private farms. In the country early in 1980 the proportion of the farms of kolkhoz members, workers and employees in rural areas not having privately owned livestock comprised 31 percent. A total of 45 percent of the families did not have cattle; 65 percent, hogs, and 76 percent, sheep and goats. Another example. Throughout the country last year about 26 kg of meat (in live weight) per standard head of livestock owned by the population were sold to the state and on farms in the Baltic Republics, 3 to 5 times more; 240 kg of milk per cow and in the Baltic Republics, 6 to 10 times more.

Principal attention is now given to the development of contractual relations in the fattening of livestock. This progressive form of cooperation between the public sector and the private sector can also be applied to the area of private horticulture and gardening.

Organizational Measures

In the Basic Trends adopted by the 26th CPSU Congress the problems of the private subsidiary sector are concentrated in the section "Development of the Agroindustrial Complex," which discusses the need for production assistance to the private subsidiary sector and the tasks for production growth in it. The private subsidiary sector is an integral part of the national economic agroindustrial complex together with kolkhozes, sovkhozes and interfarm enterprises, whose junior partner in the production of agricultural products it is.

Until recently the economic literature analyzing the problems of formation and development of the national economic agroindustrial complex in the sphere of agricultural production usually investigated only large enterprises of the public sector, which is incorrect and deprives the analysis of completeness and comprehensiveness. Basically, the topic of discussion was the sectorial set of the agroindustrial complex, not its social and economic structure, although, undoubtedly, such an investigation is highly urgent.

The development of the private subsidiary sector presupposes the implementation of certain organizational measures. Now permission is given to state agricultural enterprises and recommendations are made to kolkhozes to introduce posts of deputy directors of sovkhozes, kolkhoz chairmen or specialists in problems of management of the private subsidiary sector. Obviously, it is necessary to see to it that this provision is realized in practice. The experience of Hungary, where such posts were established, showed their expediency. Now the positions of deputy chairmen on these problems are introduced into agricultural enterprises in Bulgaria.

Kolkhozes and sovkhozes should have commissions for the private sector on a voluntary basis. These types of organizational measures are also useful at higher levels of management.

The development of the private subsidiary sector raises a number of problems on the theoretical and concrete-practical plane. These problems were discussed at the all-Union scientific and practical conference recently held by the All-Union Academy of Agricultural Sciences imeni V. I. Lenin, the Institute of Economics of the USSR Academy of Sciences and the Institute of Economics of the World Socialist System of the USSR Academy of Sciences, which was the first conference of this kind. Jurists and sociological scientists participated in its work along with economists.

The recommendations of the conference advanced the proposal on the establishment within the framework of the All-Union Academy of Agricultural Sciences imeni V. I. Lenin of a scientific and methodological council or section for an all-around generalization of the practice of management of the private sector and its relations with public production and for the development of proposals for a unified method of research in this area, which is very important for forecasting the development and determination of the measures for its support.

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ORGANIZATIONAL IMPROVEMENT OF KAZAKH SUBSIDIARY FARMS ADVANCED

Moscow SEL'SKAYA ZHIZN' in Russian 20 Jun 81 p 2

Article by I. Vorob'yev, senior scientific worker at the Virgin-Land Affiliate of the Kazakh Scientific Research Institute of Economics and Organization of Agriculture, Tselinogradskaya Oblast: "And If the Matter Is Approached Informally?"

Text Many enterprises now have subsidiary farms. This enables them to produce agricultural products for the needs of their collectives. The need for this is obvious. However, this matter is hampered by a number of circumstances. In my opinion, many problems arise only because sometimes the goal itself is not understood correctly.

For example, when developing a network of subsidiary farms, should we absolutely see to it that every city enterprise acquires its own food shop? This is an important question. We at the institute receive a flow of orders for the preparation of plans for an organizational and economic structure of subsidiary farms. Often we find that we cannot substantiate the expediency of what has been envisaged.

In North Kazakhstan there are large industrial enterprises, such as the Pavlodar Tractor Plant, the Ekibastuzugol' Association and the Sokolovsko-Sarbayskiy Ore Dressing Combine, which are able to establish substantial animal husbandry enterprises and to cultivate areas necessary for fodder production--in brief, to carry out subsidiary agricultural production on the scale and level that guarantee them the necessary profitability. However, we have even more small enterprises and organizations. What is to be done with them?

The principle "a subsidiary farm for every enterprise" is now in effect. For example, on the instruction of the oblast executive committee this year the Tselinograd Aviation Detachment must fatten 50 hogs and the Tselinenergo Association was ordered to acquire 200 head of cattle, 400 hogs and 500 rabbits. It is difficult to call the organization of such dwarfish and diversified farms logical.

Let us see how they manage things. The Tselinograd Taxi Cab Pool decided to engage in the fattening of ducks. It has a small plot of land with a lake almost 200 km away from the city. It brings there 500 to 600 ducks bought in the Tselinograd Poultry Association and mixed feed bought either on the educational farm of the agricultural institute, or on the Sovkhoz imeni M. Mametova and it hires local residents to work at the duck house. It is not difficult to note that besides money and effort the taxi cab pool does not invest anything in the production

of duck meat. From the economic point of view it is impossible to justify this effort, because it is directed mainly at the utilization of someone else's fodder and labor resources, which are scarce as it is. Nor is the money invested in subsidiary enterprises recovered.

In other oblasts of North Kazakhstan the approach is similar, that is, distorting with the strict view of things, the creative nature of the decree of the CPSU Central Committee and the USSR Council of Ministers adopted on this matter.

Of course, it is impossible to demand from the taxi cab pool to build a duck factory and a well-organized settlement for its workers and to produce the necessary amount of grain for the complex, not to mention mixed feed. However, there is a real solution--cooperation. Why should dozens of such weak enterprises not pool their money into a common "hat" and organize a truly viable and economically solvent subsidiary farm by common efforts? The cooperatives into which planning and construction organizations, installation administrations, machine building plants and higher educational institutions will enter, will be able to perform with their own forces the entire volume of work on the common subsidiary farm, from planning and construction to servicing it. At every enterprise there will be machine operators, who will cultivate the allocated land and repair equipment. On such a collective garden there will be work for city schoolchildren and students. The city can send food waste and the waste of the processing industry there. On a big farm it is much simpler to solve problems of equipment and protection of the environment.

One would think that the question as to how to interest cooperative members in a conscientious participation in the common enterprise and how to divide the products produced is not one of the most complex. It is simpler for city party committees and city executive committees to manage the work of several large cooperatives than dozens of dwarfish hog sties and duck sheds. It is most important to understand the need for cooperation and to view the matter from an informal point of view.

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AGRO-ECONOMICS AND ORGANIZATION

NONCHERNOZEM ZONE KOLKHOZES DEVELOPING COTTAGE INDUSTRIES

Moscow EKONOMICHESKAYA GAZETA in Russian No 24, Jun 81 p 19

Article by P. Koslov, deputy chief of the Main Administration for Organizational Kolkhoz Affairs of the RSFSR Ministry of Agriculture, and I. Sokolov, senior economist: "Cottage Industries of Kolkhozes"

Text The decree of the CPSU Central Committee and the USSR Council of Ministers "On the Further Development and Increase in the Efficiency of Agriculture in the Nonchernozem Zone of the RSFSR in 1981-1985" stresses the need for a top priority allocation of funds on the farms of that region for measures for an increase in the efficiency of land utilization. It is a matter of an accelerated performance of work on land reclamation, chemicalization of agricultural sectors and introduction of overall mechanization in farming and animal husbandry. This is the main way of increasing the yield of fields and strengthening the fodder base of animal husbandry. However, for the implementation of the indicated measures farms need considerable funds. The development of subsidiary enterprises and cottage industries can become one of their important sources. Furthermore, this contributes to an alleviation of the seasonal nature of labor in rural areas and to a more efficient utilization of labor resources, to which the experience of the Kolkhoz imeni Lenin in Novomoskovskiy Rayon, Tul'skaya Oblast, attests.

In the center of the village of Spasskoye, where the kolkhoz farmstead is located, there is a solid two-story building resembling an industrial enterprise.

"This is our sewing-knitwear field shop," says chairman Hero of Socialist Labor V. A. Starodubtsev. "The first stage of this shop specializes in the sewing of men's winter jackets and the second manufactures children's trousers. The shop operates on a contractual basis with the Novomoskovsk Sewing Factory and the Donskoy Hosiery Factory. Industrial enterprises provided us with equipment, helped us to train skilled personnel and supply semifinished products, from which 250 workers manufacture finished products. They manufacture more than 24,000 coats and about 1.5 million children's trousers annually. The shop delivers all output on the first presentation."

The rates and prices established in factories are in effect at the industrial shop of this farm. The moral and material incentives in effect at enterprises also apply to its workers, as well as to managers and technical personnel. Cottage industries annually bring up to 300,000 rubles of profit to the kolkhoz till. More than 1.2 million rubles of profit were obtained during the 10th Five-Year Plan. The shop construction cost the kolkhoz 267,000 rubles.

In addition to the sewing shop, on the kolkhoz there is also a mixed feed plant. Its capacity is 150 tons of output in 24 hours. The plant produces fodder for cattle, hogs and poultry. From raw materials supplied by customers the enterprise also produces mixed feed for neighboring farms. On the kolkhoz there is also a shop for the production of grass vitamin meal, granules and fodder briquettes. There is also a powerful saw frame there.

Life itself forced the kolkhoz to develop cottage industries. The point is that in connection with the extensive mechanization of labor intensive processes in animal husbandry many women were freed of work on farms. Suffice it to say that before the commissioning of the dairy complex on the farm one milkmaid serviced up to 18 cows and obtained 82 to 85 tons of milk annually. Now more than 100 cows have been assigned to every operator engaged in mechanical milking and milk production per man exceeds 500 tons annually.

For the same reason the number of kolkhoz members engaged in the fattening of cattle and hogs and in the breeding of heifers also has decreased sharply. Labor productivity on farms has risen. Now operators engaged in mechanical milking of cows spend only 1.4 man-hours per quintal of milk. These are the lowest expenditures not only in the rayon, but in the oblast as well. Labor expenditures per quintal of beef have been reduced to one-third, now totaling only 12.7 man-hours, and on pork production, to a little more than 8 man-hours. At the same time, fodder expenditure per quintal of milk, beef and pork has also been lowered.

Previously, especially in winter time, many farmers remained unemployed. Then it occurred to farm managers to organize on the kolkhoz the production of consumer goods during fall and winter and to utilize industrial production workers in field work during spring and summer. That is why on the kolkhoz the sewing-knitwear shop is also called field shop. The shop workers are entrusted with the cultivation of sugar beets on an area of 250 hectares and of fodder beets, on an area of 40 hectares. Women have mastered well the agricultural technology of cultivation of these crops. As a result, the farm annually gathers high harvests. On the average, the yield of sugar beets totaled 350 quintals and of fodder beets, 729 quintals per hectare during the 10th Five-Year Plan. Such a root yield enabled the farm to greatly overfulfill the five-year plan for the sale of sugar beets to the state, as well as to annually provide farms with succulent fodder.

After the conclusion of field work workers again return to the sewing-knitwear shop. Farmers free of work in the field also find employment there. The establishment of the shop eliminated labor turnover on the kolkhoz. Not a single person left the farm during the 10th Five-Year Plan. Moreover, an influx of man-power, especially youth, is observed. All of them were provided not only with work, but with modern well-managed apartments as well. The village workers are now uniformly employed in production throughout the year.

Having available a large labor reserve, for a number of years the kolkhoz has not enlisted city dwellers in field work. It carries out spring sowing, care of crops and harvesting with its own forces promptly and in a high-quality manner. Moreover, it helps its neighbors. For example, in 1980 sewing shop workers cultivated sugar beets on 50 hectares on the Rassvet Kolkhoz. As a result, this farm gathered more than 300 quintals of roots per hectare for the first time.

The collective of the sewing knitwear shop took it upon itself to increase the production of consumer goods 1.5-fold and to expand their assortment during the 11th Five-Year Plan. At the same time, shop workers took it upon themselves to increase the yield of sugar beets on the farm to 400 quintals and of fodder beets, to 1,000 quintals per hectare.

Many farms in the nonchernozem zone, like the Kolkhoz imeni Lenin, following party and government decisions and the Model Kolkhoz Rules, actively develop subsidiary enterprises and cottage industries. For example, on farms in Gor'kovskaya Oblast there are now about 3,000 various subsidiary enterprises. Many of them have been established on a cooperative basis with industrial enterprises. Such cooperation has also been developed in Vladimirskaya Oblast. In particular, kolkhozes in Gus'-Khrustal'nyy Rayon have formed a cooperative with the Murom Radio Plant and the Vladimir Haberdashery Factory. Cottage industries also play an important role in the intensification of agricultural production and in the solution of social problems of rural areas.

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AGRICULTURAL MACHINERY AND EQUIPMENT

PARTY CONGRESS DECISIONS ON AGRICULTURAL MACHINE BUILDING

Moscow TRAKTORY I SEL'KHOZMASHINY in Russian No 5, May 81 pp 1-3

[Article by A.A. Yeshevskiy, minister of Tractor and Agricultural Machine Building: "Implement the Decisions of the 26th CPSU Congress"]

[Text] The workers in tractor and agricultural machine building, similar to all Soviet people, heartily welcomed the historic decisions handed down during the 26th CPSU Congress and the positions and conclusions contained in the report delivered by the General Secretary of the CC CPSU Comrade L.I. Brezhnev, with regard to the further and comprehensive development of the national economy and the agrarian policies of the party and state.

The essence of the party's economic strategy during this modern stage is clearly expressed in the main task of the Eleventh Five-Year Plan -- achieving further growth in the welfare of the Soviet people. The congress approved the party's program for developing a special food program and creating an agroindustrial complex for the purpose of increasing agricultural production sharply and raising its efficiency.

The tractor and agricultural machine building branch is playing a considerable role in the practical realization of this strategic trend in the party's domestic policies. "Here we have in mind" stated Comrade L.I. Brezhnev, "further growth in the technical equipping of agriculture and improving the productivity, durability and reliability of the machines and equipment being supplied to agriculture."

Based upon the decisions handed down during the 26th CPSU Congress, the "Principal Trends for Economic and Social Development During the 1981-1985 Period and for the Period Up To 1990" and the decisions handed down during the July (1978) and October (1980) Plenums of the CC CPSU, our branch has been assigned clear tasks for the Eleventh Five-Year Plan. In addition, the delivery volumes for agricultural equipment and the requirements with regard to the technical level of this equipment have been established.

The plans call for agriculture to be supplied with 1.87 million tractors, 600,000 grain harvesting combines and 13.5 billion rubles worth of agricultural machines.

Further growth must be achieved in the production of powerful tractors and an increase of almost twofold must be realized in the production of farm-leveling machines for the T-150 and K-701 tractors.

The production of anti-erosion equipment is to increase by a factor of 1.9.

Commencing in 1982, the plans call for the agricultural requirements for spare parts for tractors and agricultural machines to be met in conformity with the approved norms.

In addition to increasing the amount of equipment being produced, the principal and most urgent task confronting the branch is that of achieving a sharp improvement in its technical-economic parameters. "We have a requirement for" pointed out Comrade L.I. Brezhnev, "new and modern equipment that will meet the requirements for large-scale specialized production and permit the introduction of a progressive technology. It is wrong to adopt the position that life is rushing us, inexorably urging us on and not allowing us an hour of respite."

By implementing the party's agrarian program and following Lenin's precepts, the CC CPSU, the Politburo and Comrade L.I. Brezhnev personally are displaying constant concern for the development of our branch.

The capital investment volumes allocated for the Eleventh Five-Year Plan equal the resources which were assimilated in the branch during the three preceding five-year periods. Today it can be stated with confidence that tractor and agricultural machine building is being born a second time.

Taking into account the great scale of the assigned tasks, those enterprises of the branch which are under construction or being modernized are considered to be construction projects of special state importance. USSR Gosplan, USSR Gosnab and USSR Gosstroy have been assigned the priority task of determining the contractual work limits for the construction and modernization of agricultural machine building projects and ensuring that these construction projects are provided with the necessary logistical resources and equipment.

Such exceptional attention on the part of the party towards the development of tractor and agricultural machine building is bringing forth a flow of creative energy from the branch's workers, who are indeed grateful.

The principal and most important trend in our work during the Eleventh Five-Year Plan will be that of creating new machines having high technical-economic parameters.

During the 1981-1985 period, 193 new tractors, agricultural machines and devices must be created and 206 turned over to production operations and, as well, 68 types of agricultural machines and four tractors must be removed from production owing to obsolescence. All of the equipment produced should be modernized in the interest of raising its technical level and reliability.

Special attention should be given to the production of powerful tractors. In order to raise labor productivity in the cultivation of row crops, the construction of a complex of plants for the production of a multi-purpose row crop tractor having a power rating of 150 horsepower will commence during the current five-year plan.

The nomenclature of agricultural machines included in the kits for T-150 and K-701 tractors must be raised to 90 types. They should include: a plow having a variable

operating width, a swivel plow and others. Agriculture must be fully supplied with such basic machines for a soil protective technology as deep rippers, stubble field seed drills, wide-cut cultivator-sweeps, needle-shaped harrows and others.

A requirement exists for accelerating the creation and introduction into production operations of large machines for applying mineral fertilizers that will ensure an increase in productivity of more than twofold and low volume and ultra low volume sprayers which will make it possible to lower substantially the consumption of chemical agents for protecting plants and reduce their harmful effect on the environment.

In order to improve the agricultural practices employed in soil cultivation, the production of multiple-unit assemblies and soil cultivation machines having active working organs must be expanded and for the industrial technologies used in the growing of row crops -- highly productive machines and implements, including precision seed drills, must be created and mastered.

Prior to the opening of the 26th CPSU Congress, the series production of the modernized Sibiryak combine commenced at the Krasnoyarsk Combine Plant. This combine is distinguished by higher productivity and greater reliability than its predecessor unit. The collective of Rostsel'mash must accelerate the development of the new grain harvesting combine, which has a capability of no less than 7 kilograms per second, and organize its production during the current five-year plan.

For the combines to operate at maximum capability, the production of windrow harvesters having a cutting width of 10-12 meters, reverse self-propelled harvesters with a cutting width of 10-12 meters and also towed wide-cut harvesters must be mastered.

The productivity of the new grain cleaning and drying complexes must be raised by a factor of 2-4, so as to reach 50-100 tons per hour.

The complex of highly productive machines for grain crops also calls for the creation of a new grain-fertilizer precision seed drill which will make it possible, with minimal expenditures of labor, to form up 10 and 16 meter wide-cut units with T-150K and K-701 type tractors.

The problem of creating light mechanization equipment for use on private plots, animal husbandry farms, hotbeds, nurseries and gardens has become a very acute one in our country. Thus the plans call for the creation of capabilities at the Kutaisi Miniature Tractor Plant Production Association. The production of 5-7 horsepower engines must be commenced in 1981 and in 1983 -- miniature 10-12 horsepower tractors. In 1985, the production of these units must be raised to 10,000 and 2,500 respectively.

On the whole, during the Eleventh Five-Year Plan the tractor and agricultural machine building branch must supply agriculture with sufficient equipment to ensure the complex mechanization of the production of grain crops, sugar beets, raw cotton, spinning flax and also to raise the mechanization level for harvesting operations: potatoes using combines -- to 85 percent, cabbage -- to 75, tomatoes -- to 40, carrots -- to 20, tea and common hops -- to 80 percent.

As a result, the power-worker ratio for agriculture per 100 hectares of sowing area must be raised to 380 horsepower by 1985 and per individual worker -- to 38-40 horsepower.

All work concerned with research for or the creation of new tractors and agricultural machines, or the modernization of existing ones, must be developed based upon the "System of Machines for the Complex Mechanization of Agricultural Production During the 1981-1990 Period." It defines the nomenclature, principal parameters and technical level for those machines required for carrying out the technological processes in agriculture, in conformity with the soil-climatic zones of the country and the crops under cultivation. For the Eleventh Five-Year Plan, this "System of Machines" includes 1,062 items of technical equipment from the products list of Minsel'khozmash [Ministry of Agricultural Machinery]. Of this number, 564 of the machine items are in production and 71 have been created and recommended for production. More than 400 of the machines and devices require a great amount of work in connection with creating their designs and mastering their production.

The efforts of the design organizations and the production collectives of tractor and agricultural machine building must be concentrated on implementing the "System of Machines," creating designs for machines having high technical-economic parameters and organizing their production.

By 1985, the technical level of the tractors and agricultural machines must be raised compared to the figures for 1980:

...growth in the productivity of the principal types of agricultural machines by a factor of 1.5 and a reduction in their specific material-intensiveness;

...an increase in the average power rating of the tractors and a reduction in their specific material-intensiveness;

...a reduction in the average specific consumption of fuel by engines from 180 to 170-175 grams per (horsepower per hour) and this will produce a savings during the five-year plan of approximately 1.2 million tons of diesel fuel;

...extensive hydro-fixation of the machine-tractor units;

...an increase in the life of engines and transmissions up to the first major overhaul from 5-6 to 8-10 thousand operating hours and supporting systems for the full service life of the tractors, with no repair work being carried out. The average operating times of tractors between breakdowns must be raised by 20-70 percent, with a reduction taking place in the labor-intensiveness in technical servicing of no less than 10-15 percent and a reduction of 15-30 percent in labor expenditures for the carrying out of current repair work. The coefficient of readiness of the agricultural machines must be raised to 0.95-0.97.

A further improvement in labor productivity in agricultural production is imposing new requirements with regard to the tractors and agricultural machines. They must be equipped with automatic systems for controlling and adjusting the work processes, hydraulic drives for the working organs and safe cabins providing comfortable working conditions and they must possess a high level of reliability and require only minimal expenditures of labor for servicing and repair work.

A reduction in the idle time of tractors and agricultural machines during operations and for the purpose of carrying out repair work requires that a complete supply of spare parts be available for use.

An improvement in the technical level of the machines and in their service life and a reduction in metal-intensiveness require a considerable expansion in the use of progressive materials and complete items and the accelerated introduction into production operations of highly efficient technological processes and scientific and engineering achievements. The branch's enterprises must expand considerably their use of highly durable cast iron, powder metallurgy products, plastics and so forth.

More extensive use must be made of the leading methods for a strengthening technology, based upon laser techniques and plasma and ionic coatings, and also of the production of parts using a non-waste product technology.

A problem of special importance -- raising the quality of the products being produced. Despite certain positive achievements, serious shortcomings still persist here just as in the past. Complaints are still being received regarding the quality of the machines. Consumers have also registered their disappointment over products being produced at the Chelyabinsk Tractor Plant, the Taganrog Combine Plant, the Moscow Plant for Hydraulic Tractor Units, the Planning Department of Odessapochvomash and a number of other enterprises.

Importance is attached to raising the responsibility of leaders not only with regard to the creation and production of machines but also for their efficient operation when in the hands of the consumers. Owing to low levels of quality, reliability and durability for a number of machines being produced for agriculture, operations have been hampered by extensive periods of equipment idle time, losses in agricultural products and considerable expenditures of resources for the carrying out of repair work.

Thus exceptional importance is attached to ensuring that each principal designer and the leaders of enterprises remain aware of how the machines created and produced by them are performing and the degree to which they are influencing the national economy. The prestige of the branch, the national economic effect and our concern for agricultural production are involved here.

In this sense, great importance is attached to organizing constant and efficient contacts with workers at Minsel'khoz [Ministry of Agriculture], Goskomsel'khoztekhnika and USSR Minvodkhoz [Ministry of Water Resources] when developing the agrotechnical requirements, creating, preparing production operations and producing new machines and when determining the national economic requirements for agriculture and for land reclamation equipment.

In raising the technical level of tractors and agricultural machines and reducing the schedules for creating and mastering new equipment, a leading role must be played by the leading institutes of MATI [State All-Union Scientific Research Institute of Tractors] and VISKhGM [All-Union Scientific Research Institute of Agricultural Machinery] and also by the branch's design organizations. These organizations must ensure the development and implementation of special purpose complex programs aimed at solving the more important scientific-technical problems.

At the present time, a group consisting of many thousands of scientific-technical workers and designers is working within the branch on the creation of new technical equipment for agriculture. This group includes 25 doctors and more than 500 candidates of science.

Constant concern must be displayed for raising the effectiveness of the scientific studies and strengthening the mutual contacts between science and production.

Towards this end, it will be necessary, within a brief interval of time, to carry out work aimed at improving the organizational structure of the NII (Scientific Research Institute) and the GSKB (State Special Design Office) and creating large-scale complex scientific centers for tractor, engine and agricultural machine building.

At the present time, measures are being carried out in the ministry aimed at strengthening the experimental-production base of the NII and KB (Design Office), raising the rights and responsibilities of the general and chief designers and making more extensive use of the experience of other machine building ministries and foreign firms in the creation and introduction of new equipment. This work must be carried out in the various areas -- at each design office and at each plant.

Under these conditions, a clear need exists for recognizing the importance of creating machines on a high technical level. It must be remembered that the design of a machine is created on one occasion by a collective consisting of several hundreds of individuals and that subsequently it is produced and operated by thousands and tens of thousands of people. Thus, if a designer is guilty of a particular miscalculation, a high level of labor-intensiveness may result in the production of the item at issue or great operational expenses or considerable expenditures of spare parts may ensue. However, some enterprise leaders are still not attaching sufficient importance to improving the work of the design organizations.

The leaders of institutes and the general and chief designers, while displaying constant concern for strengthening their organizations with skilled personnel, must at the same time display high principles and prohibit the use of designers and technologists for work other than that for which they were intended and they must also ensure that the capabilities of the experimental departments are not employed for series production operations.

In addition to creating new equipment, one vitally important problem of the branch is that of developing the capabilities for the production of such equipment. By no means can the scope of this task be compared with that for the previous five-year plans.

The existing capabilities for producing castings must be increased by a factor of almost 1.5. More than 100 active enterprises must be expanded and modernized and several new plants built.

Our responsibility consists of organizing the work in a manner such that all planned capabilities are introduced into operations and mastered, each ruble is utilized in a thrifty manner and a rapid return obtained.

Radical improvements must be achieved primarily in the work of our planning organizations, technological institutes, the enterprises themselves and in the Capital Construction Administration.

When designing the branch's projects, extreme importance is attached to taking into account those design and space-planning solutions which will ensure high labor productivity in the construction-installation work and greater use of prefabrication in construction. Greater use must be made of light steel and aluminum construction structures and also other planning solutions aimed at achieving economies. Computations have shown that these measures can accelerate construction by a factor of 1.5-2.

A situation must be achieved wherein efficient network graphs are introduced into operations at each project under construction and at each enterprise undergoing modernization.

An all-union headquarters for controlling fulfillment of the decrees adopted by the CC CPSU and the USSR Council of Ministers for developing the branch has been formed within the ministry. This headquarters, which involves the participation of the leaders of construction ministries, USSR Gosstroy, USSR Gosnab, USSR Stroybank (All-Union Bank for the Financing of Capital Investments) and other organizations, is already in operation. It should become an efficient mechanism for exerting a direct and positive influence upon the affairs of all construction projects. Thus, in carrying out the decisions as handed down, there should be no shortages in workers, materials, structures, mechanisms or transport vehicles and practical prerequisites will be created for the fulfillment and over-fulfillment of the plans for capital construction.

Great importance must be attached to the technical re-equipping of existing plants, since these expenditures are reimbursed more rapidly and produce comparatively great economic results. It has been established that the specific capital investments per unit of increase in capabilities, in the case of technical re-equipping, are less by a factor of 2-2.5 than the capital investments for expanded reproduction.

In light of the requirements of the 26th CPSU Congress with regard to raising the efficiency of use of all available resources -- the economic structure must be thrifty -- a completely new approach must be employed in examining the tasks for strengthening the branch's regime for thrift.

Priority importance is attached to economizing in the use of metal. This is particularly important in view of the fact that, just as in the past and despite a number of measures aimed at strengthening organizationally the services for material norms in the branch, no noticeable improvements have been observed in this work.

More extensive use must also be made of efficient materials and metal substitutes. It is known, for example, that 1 ton of parts made from iron powders or plastic makes it possible to realize a savings of up to 2.5 tons of metal. NIItraktorosel'khoz-mash [Scientific Research Institute of Technology for Tractor and Agricultural Machine Building], jointly with interested institutes, must develop a special purpose program which will make it possible, by the end of this five-year plan, to produce 9,000-10,000 tons of parts using the methods of powder metallurgy and approximately

40,000 tons of parts using plastics and other substitutes. This will make it possible in the future to realize a savings in the form of more than 160,000 tons of rolled metal.

More active work must be carried out aimed at strengthening contacts between our branch and other branches, in connection with the delivery and development of economic profiles of rolled metal and materials -- efficient metal substitutes.

The principal factor for economic growth, as emphasized during the 26th CPSU Congress, is that of raising labor productivity. In order to ensure unconditional fulfillment of the plan in terms of this indicator, effort must be directed mainly towards the development and implementation of measures which will improve labor productivity by no less than 70-75 percent of the established task as a result of technical measures, improve the organization of production and labor by no less than 12-13 percent and eliminate unproductive losses in working time.

Here we have great unused reserves at our disposal. Conditions must be created at each enterprise for highly productive labor, for accelerating complex mechanization and automation in every possible way and for improving the organization of labor.

Full use must be made of the reserves available for introducing the brigade form for organizing and paying for labor. In 1981, one out of every two workers must work in brigades and by the end of the five-year plan up to 70 percent of the workers will be included in the group forms for organizing labor.

"The work must be organized" commented Comrade N.A. Tikhonov in a report delivered before the party congress, "in a manner such that growth in output production at existing enterprises is achieved with a stable or even fewer number of workers." This requirement must provide the foundation for work aimed at stabilizing the labor collectives and retaining personnel at their positions -- a most important component of the branch's productive forces.

Considerable manpower reserves are to be found and are available for use in those areas where the directors of enterprises, instead of proving in all instances their inability to fulfill their plans owing to personnel shortages, purposefully and consistently carry out the technical modernization of production, eliminate manual labor, raise the level of labor organization and devote thought to the content and attractiveness of the work.

At the present time, with exceptional attention being given to the branch by the CC CPSU and the USSR Council of Ministers and with all of the conditions for fruitful work having been created, it is a matter of honor for the leaders of associations and enterprises to ensure the complete use of resources and the placing in operation of all of the planned housing construction projects of a socio-cultural or domestic nature as well as subsidiary farms.

The implementation of a social program in the branch is an inalienable part of the concern being shown for the branch's workers and at the same time for solving to a considerable degree those problems associated with supplying the enterprises with workers.

The fulfillment of the tasks of the Eleventh Five-Year Plan -- the criteria for which will be used for evaluating the business-like and political qualities of the economic personnel and their ability to operate in conformity with the new conditions, will bring about a change in the intensification of production and ensure improved efficiency and quality. A requirement exists for ensuring that the operational style and level of responsibility of the leaders of associations and enterprises, the VPO and of the branch's administrations and departments are in keeping with the modern requirements of the party. Every attempt must be made to achieve improvements in executive discipline, in the responsibility for assigned tasks and in the initiative and interest required for solving the most important problems of the branch's operations.

Leading workers and engineering-technical workers of the branch -- delegates to the 26th CPSU Congress -- addressed an appeal to all of the labor collectives requesting that a socialist competition be launched aimed at achieving ahead of schedule fulfillment of the plan for 1981 and for the Eleventh Five-Year Plan as a whole. Guided by the decree of the CC CPSU, the USSR Council of Ministers, the AUCCTU and the Komsomol Central Committee entitled "All-Union Socialist Competition for the Successful Fulfillment and Over-Fulfillment of the Tasks for the Eleventh Five-Year Plan," the task consists of supporting the initiative displayed by the delegates to the 26th CPSU Congress in all of the labor collectives. Taking advantage of all of the best developments which appeared during the pre-congress period of urgent work, the work must be organized such that the competition is launched in all of the collectives under the slogan "To Perform Efficiently and in a High Quality Manner!" In addition, each individual must make his own contribution towards raising the technical level of the machines being produced and improving the final operational results.

The enthusiasm and creativity of the remarkable cadres of workers, engineering-technical workers and office workers serve to guarantee that the tasks confronting the branch will be solved successfully. For successful work performed during the Tenth Five-Year Plan, the collectives of the Minsk and Khar'kov tractor construction associations, the Serp i Molot Motor Construction Association, the Planning Department of Rostsel'mash and the Tashsel'mash and Dnepropetrovsk Combine Plants were awarded challenge red banners of the CC CPSU, the USSR Council of Ministers, the AUCCTU and the Komsomol Central Committee; the Tselinograd Association for Anti-Erosion Equipment, the Minsk Motor Plant, the Ryazsel'mash and Kiyevtraktorodetal' Associations and the Cheboksary Unit Plant were awarded decorations. High governmental awards were conferred upon more than 5,500 manual workers and engineering-technical workers in the branch.

The high title of Hero of Socialist Labor was conferred upon Brigade Leader M.K. Arkatov, the General Director of the Khar'kov Tractor Plant Production Association V.V. Biblik, machinist K.Ye. Ulanov at Rostsel'mash and upon welder M. Muydinov at Tashsel'mash.

Inspired by the historic decisions handed down during the 26th CPSU Congress and the tremendous concern being displayed for the development of our branch by the communist party and by the General Secretary of the CC CPSU Comrade L.I. Brezhnev personally, the workers in tractor and agricultural machine building are devoting all of their efforts, knowledge and experience towards carrying out the very important tasks of

the Eleventh Five-Year Plan and they are making a worthy contribution towards implementing the plans for communist construction.

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TILLING AND CROPPING TECHNOLOGY

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TILLING TO COMBAT EROSION IN SOUTHEASTERN EUROPEAN RSFSR

Moscow SEL'SKOYE KHOZYAYSTVO ROSSII in Russian No 2, Feb 81 pp 36-38

[Article by A. Shabayev, candidate of agricultural sciences and head of department of Soil Protection Against Erosion at the Scientific Research Institute of Agriculture for the Southeast: "Campaign Against Erosion: Hypotheses and Reality"]

[Text] It is by no means wrong to state that one vital problem in the development of agriculture in the Volga region is that of protecting and making rational use of the soil resources. Indeed, more than 9 million hectares of agricultural land in this region are subject to water erosion and 1.5 million hectares -- to wind erosion.

Taking into account the relief of the area, the soil-climatic conditions and the manner in which the "malady" manifests itself in the Volga region, three large erosion zones are singled out -- water, wind and water-wind (see Figure 1). The



Key:

- I. Wind erosion zone
- II. Water erosion zone
- III. Zone of combine water and wind erosion.

Figure 1. Diagram of erosion zones in the Volga region

southeastern part of the territory, of which we are speaking, is situated in the zone of active wind erosion (Pre-Caspian Lowland). The remaining area is in the zone of water and water-wind erosion. Overall, today roughly 60 percent of the valuable arable lands require protection against erosion.

What measures are being taken to combat this "ailment" which causes disaggregation of soils and lowers their fertility?

Among the soil protective technological methods, a leading place is occupied by fall plowing soil cultivation. It is carried out either with stubble retention or with furrow slice inversion. A change in the method of fall plowing cultivation determines all of the subsequent operations to be employed in the cultivation of the agricultural crops.

Against a mouldboard background (plowing crosswise to a slope with subsoil plowing, ridging and digging of holes), the technological operations are carried out using general purpose implements and attachments for them. Against a stubble field background (sweep tilling, non-mouldboard, minimal) -- special machines and mechanisms (sweeps, disks, stubble field sowing machines). In the process, the methods employed for placing the post-harvest residues in the rooting layer (with furrow slice inversion or without it) affect in different ways the dynamics of fertility and the physical-chemical properties of the soils. Thus a differentiated approach should be employed when selecting the soil tilling methods, an approach which takes into account the soil-erosion characteristics of the particular region.

The soil protective technologies were studied at the NIISKh Yugo-Vostoka (Scientific Research Institute of Agriculture for the Southeast and the Kuybyshev NIISKh, at the Ul'yanovsk, Penza and Volgograd experimental stations and also at the Saratov and Volgograd SKhI's (agricultural institute). What have the results of these studies proven? In the zones of wind and water-wind erosion, on chestnut and light chestnut soils of the dry steppe on the left bank and for the purpose of protecting the land and keeping it damp, it is best to employ a stubble field technology involving the use of sweeps and stubble field multiple-unit sowing machines. During dry years it produces a fine effect on slopes along the right bank. Following stubble field tilling, the wind velocity in the surface layer decreases by a factor of 2-3 and the withdrawal of soil particles ceases almost completely. A stable snow cover makes it possible to accumulate 15-30 additional millimeters of soil moisture. The yield increases by 1.5-2 quintals per hectare compared to the conventional (mouldboard) technology.

In the zone of water and water-wind erosion (especially in the right bank regions on chernozem soils of average and heavy mechanical texture), fine results are obtained from the mouldboard technology. Surface (minimal) tilling appears to be very effective in the cultivation of winter crops following non-fallow predecessor crops. It is already being employed today by leading farms in the Volga region.

The soil-protective effectiveness of the mouldboard and stubble field technologies were studied on sloping lands. Since 1973, a study has been underway at the Tsentral'noye Experimental-Demonstration Farm of the NIISKh Yugo-Vostoka, on southern medium-eroded chernozem soils (slope of 4-6 degrees with southern exposure), with regard to the effect of the principal soil cultivation methods on snow distribution,

water runoff, erosion and the moistening of soil. The average indicators of the effectiveness of the soil-protective technology for growing grain crops in a six-field crop rotation plan 1973-1979 are furnished in Table 1.

Data accumulated over a period of many years reveals that in the case of the mouldboard technology system, plowing by stages and plowing with the digging of holes increase the height of the snow cover and the water supplies in the snow by only 3-4 percent. Stubble field (sweep) tilling makes it possible to increase the height of the snow cover by 3-4 centimeters and the supply of water in the snow -- by 14 millimeters (17 percent).

Conventional plowing crosswise to a slope retains moisture very well. Over a period of 7 years in which we conducted observations, plowing by stages alone served to reduce the runoff by 3.1 millimeters.

On the average for 5 years, the erosion of soil with conventional plowing amounted to 5.3 tons per hectare. When plowing by stages was employed, it decreased by 51 percent, plowing with the digging of holes -- by 44 and sweep tilling -- by 36 percent. During rotation in a six-field crop rotation plan, a soil layer 0.6-1.4 millimeters thick was protected.

The average yield for a rotation in a crop rotation plan is roughly the same for both the mouldboard and stubble field technologies. However, the stubble field technology is more effective in a fallow section of a crop rotation plan; the average increase in yield for grain crops is 1.2 quintals per hectare. Experiments carried out at the Klyuchevskiy Sovkhoz in Krasnoarmeyskiy Rayon have also shown that the use of a sweep technology in the fallow section of a crop rotation plan, on the average for a period of 4 years, produces an increase in barley yield of 1.6 quintals per hectare. This is 18 percent more than that obtained when the conventional technology was employed. Moreover, the production cost for a quintal of grain decreases from 3.44 to 3.34 rubles.

In the row-crop section, the stubble field technology is inferior to the mouldboard technology. This is associated with the fact that the weediness of the crops increases. In the case of the stubble field technology, the weediness by the end of a rotation in a crop rotation plan was higher by a factor of 1.5-2 and by the time the sowing of early grain crops was carried out the soil had accumulated 2-3 times less nitrate nitrogen than when the mouldboard technology was employed.

The studies and experiments also indicated that in the zone of wind erosion, on sandy and sandy loam soils (southern and southeastern parts of the left bank), stubble field tilling must be carried out on all fields of a crop rotation plan having a short rotation. The mouldboard technology is best used only when organic fertilizers are applied in connection with the strip placement of agricultural crops or the strip alternation of plowing and sweep tilling. A maximum amount of stubble should be retained on the surface of a field, since it reduces pulverization of the soil. This requires the use of multiple unit machines and implements having sweep working organs.

In the zone of water erosion, during the cultivation of all agricultural crops on slopes, the technology employed must ensure maximum absorption by the soil of the precipitation that falls. Here mouldboard tilling is most effective.

TABLE 1

Cultivation Technology	Method and Depth of Principal Tilling	Runoff of Water supplies in Snow Plus Precipitation during thawing, mm	Erosion of Soil by Thaw Water, in tons per hectare	Overall Yield, Moisture quintals per hectare in Spring.
Mouldboard (shallow plowing BDT-2.2 principal tilling; moisture retention BZSS-1; cultivation KPS-Ch; sowing S2-3.6; packing ZKSSh)	Plowing to 25-27 cm By stages to 25-27 cm + 12 cm With digging of holes to 25-27 cm Sweep method to 25-27 cm	79.8 62.7 62.1 93.8	12.0 8.9 14.3 11.8	5.3 2.6 3.0 5.4
				296 309 296 315
				20.6 22.2 20.5 20.2

On autumn plowed land and bare fallow, thaw waters are best retained by means of deep plowing crosswise to the slope. On slopes on which the gradient is more than 2 degrees, special methods should be used for retaining the water -- plowing according to contour lines, plowing by stages, subsoil plowing, digging of holes with intermittent ridging. Strip and a contour-buffer arrangement for crops, slitting and sweep tilling of the soil with stubble retention are effective for combating this "siliment" on severely eroded slopes.

In a zone in which both water and wind erosion are present, stubble tilling in a crop rotation plan must necessarily be combined with mouldboard tilling on soils having a heavy or medium mechanical structure. For six to nine field crop rotation plans, use should be made of the sweep technology on 4-6 of the fields and plowing -- on 1-2 of the fields (for fallow, for row crops and following row crops).

Depending upon the weather conditions, the physical properties of the soil and the presence of post-harvest residues, a conversion can be made from one plan to another. In order to eliminate the spring deficit of nitrogen, additional fertilizer should be applied. In the campaign against weeds, herbicides and post-harvest shallow plowing using wide-cut KPSh-9 sweeps should be employed. Windbreak strips consisting of high stalk plants should be sown on the fallow tracts.

Model plans for a soil protective technology for the cultivation of crops in a six-field crop rotation plan are furnished in Table 2.

In 1979, in five oblasts of the Volga region, the mouldboard and stubble field soil protective technologies were employed on 5 million hectares, including the use of sweep tilling on an area of 1.5 million hectares. In particular, extensive use was made of the stubble field technology in the left bank rayons in the zone of wind and water-wind erosion -- in Novousenskiy, Ivanovskiy, Krasnokutskiy and Orinskiy Rayons. Anti-erosion equipment is being used here over large areas, including sweeps and stubble field sowing machines. Today, improvements in the soil-protective technologies are associated with the rational use of the conventional (accepted for the zone) and sweep (developed for Kazakhstan) technologies, under the conditions found in our

TABLE 2

Soil Protective Technology

Number of Field	Crop	1st Plan	2d Plan
1 and 2	Clean fallow, winter crops	Tilling LDG1-10 to 5-6 cm. Tilling KPC-2-150 to 25-27 cm. Harrowing LDG1-10, Tending KPS-3.6, KPSh-9.0, KSh-3.6. Following winter crops S2S-2.1.	Shallow plowing LDG1-10 to 5-6 cm. Plowing PN-8-35 to 25-27 cm. Harrowing BZSS-1.0. Tending: 3 cultivations KPS-4 (KPSh-9.0). Pre-sowing cultivation KPS-4. Sowing of winter crops C2P-2.1).
3	Spring wheat	Tilling LDG1-10 to 5-6 cm Tilling KPSh-9 to 10-12 cm, KPC-2-150 to 20-22 cm. Harrowing LDG1-10. Sowing S2S-2.1 Shallow plowing LDG-10 to 5-6 cm. Plowing PN-8-35 to 30-32 cm. Harrowing BZSS-1.0. Two pre-sowing cultivations KPS-4, 0-3.8	Tilling LDG1-10 to 5-6 cm. Tilling KPC-2-150 to 25-27 cm. Harrowing LDG1-10. 2 cultivations KPSh-9, KPS-3. Sowing S2S-8. Tending: harrowing, 1-2 mechanical tillings plus herbicides
4	Corn	Sowing S2S-8. Harrowing two times. Tending: 2 cultivations plus herbicides Shallow plowing BDT-7.0 to 8-10 cm Tilling KPC-2-150 to 20-22 cm Harrowing LDG1-10. Sowing S2S-2.1.	Shallow plowing BDT-7.0 to 8-10 cm. Plowing PN-8-35 to 20-22 cm. Harrowing BZSS-1.0. Pre-sowing cultivation KPS-4.0. Sowing S2P-3.6.
5	Spring Wheat	Tilling LDG1-10 to 5-6 cm. Tilling KPC-2-150 to 20-22 cm. Harrowing LDG1-10, Sowing S2S-2.1.	Tilling LDG1-10 to 5-6 cm. Tilling KPC-2-150 to 20-22 cm. Harrowing LDG1-10 Sowing S2S-2.1.
6	Spring Grain Crops		

Note: The LDG1-10 is a shallow plow with needle-shaped disks. In its absence, the tilling is carried out using a BIG-3 needle-shaped plow or shallow plow with LDG-10P flat disks. When sowing with S2-3.6 and S2P-3.6 sowing machines, pre-sowing cultivation is carried out in advance.

region. At the same time, basically new technologies are required in all probability for soils of medium or heavy mechanical texture in the zone of water and water-wind erosion. They must combine the virtues of both the mouldboard and stubble field tilling technologies.

The Department of Soil Protection Against Erosion of the NIISKh for the Southeast undertook to solve this task. Our specialists recommended that the stubble and post-harvest residues be arranged locally in the form of compact stubble windbreak strips on the surface of a field (see Figure 2. Ridge-windbreak strip tilling of soil) [photo not reproduced]. This method (protected by author's copyright) is carried out following the harvesting of the agricultural crops and simultaneously with shallow plowing of the soil or during autumn plowing using special working organs. The next operations are carried out using conventional implements. A more detailed study of the ridge-windbreak strip tilling of soils confirmed the working hypothesis: during the formation of post harvest residues in the form of compact stubble windbreak strips, their snow distribution and anti-erosion effects are intensified.

In order to decide when it is best to create compact stubble windbreak strips, it was necessary to develop an experimental soil protective technology for the cultivation of agricultural crops. In addition, it includes a crop harvesting process (see Figure 3. Technology for the harvesting of grain crops with the formation of compact stubble windrow strips: a) the formation of a windrow having vertically positioned plants, during simultaneous shallow plowing of soil; b) harvesting of crop from vertical windrow, with compact stubble windrow strip left behind) [photo not reproduced]. The essence of this innovation is as follows: during the phase of waxy ripeness, the stalks of the grain crops are cut off under the tillering node over an area 4-6 meters in width. The stalks are used for forming windrows of vertical standing plants, in the form of a continuous sheaf, the lower portion of which rests in an open furrow, with the soil clinging to the remains of the root systems. Following ripening and drying, the upper portion of the stand of stalks is cut off and thrashed and the stubble windrow strips are left behind.

What is the "working hypothesis" of the new technology? The surface of the soil from which the stalks were removed early turns out to be tilled. As a result, a sharp reduction takes place in the losses of soil moisture caused by evaporation and it becomes easier to combat the weeds. A delay in carrying out shallow plowing of just 5-10 days leads to an increase in weediness of 26-54 percent and to a reduction in the spring wheat yield of 5-22 percent. Tilling carried out simultaneously with the harvesting work makes it possible to avoid such consequences. In a vertically standing windrow, the grain ripens more rapidly and dries out well even following rainfall. When the harvesting work has been completed, the locally arranged compact stubble windbreak strips of an anti-erosion nature remain out on the surface of the fields. Under favorable conditions, winter crops can be sown between them or bastard fallow tilling carried out.

Computations have shown that labor expenditures are reduced by 15 percent during harvest operations when the new technology is employed. And when one considers that a considerable reduction takes place in crop losses as well, then the promising nature of this new development becomes quite clear.

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TILLING AND CHOPPING TECHNOLOGY

ANTI-EROSION TILLING TECHNOLOGY RECOMMENDED FOR SOUTHERN KAZAKHSTAN

Alma-Ata SEL'SKOYE KHOZYAYSTVO KAZAKHSTANA in Russian No 4, Apr 81 p 23

[Article by B. Tagisov, candidate of agricultural sciences: "Soil-Protective Tilling of Slopes"]

[Text] The water erosion of soil is still being observed in agricultural production in the southern oblasts of Kazakhstan and in the zone of the Zailiyskiy, Dzhungarskiy and Alatau piedmont plains. The scientists and farm specialists are carrying out a great amount of work aimed at eliminating this condition.

A study of the effectiveness of the principal tilling of the soil has shown that the amount of snow cover, for variants of an experiment, fluctuated from 29 centimeters with mouldboard plowing to 38 centimeters with sweep tilling. The supplies of water amounted to 87 and 114 millimeters respectively. The maximum runoff of thaw waters from plots having mouldboard or sweep tilling -- 21.8 and 23.2 millimeters. The digging of holes and slitting of mouldboard autumn plowed land promoted a reduction in the runoff of thaw waters of 6-8 and slitting in the case of sweep tilling (compared to control) -- of 11 millimeters.

Whereas on mouldboard autumn plowed land the average amount of erosion was 3.9 tons per hectare, in the case of sweep tilling the figure was two times less.

A review of soil erosion caused by spring and summer rainfall has shown that this type of erosion predominates in the subzone of dark chestnut soils in the Zailiyskiy Alatau. The most stable variants were also those which involved use of the sweep tilling technology. We were able to establish the fact that the anti-erosion stability of soil is almost three times higher than control when slitting is employed. At the same time, an increase takes place in the water durability of the structure. This was observed throughout the entire growing season for barley.

On the average for a period of 4 years, the yield obtained from slitted plots amounted to 16.5 quintals and for control -- 13.3 quintals per hectare. In the case of plowing with digging of holes and sweep tilling supplemented by slitting, the increases were 2.2 and 3.8 quintals respectively. The net income per hectare from plowing with digging of holes was higher by 6.33 rubles, slitting with mouldboard plowing -- by 4.22 rubles, from sweep tilling with slitting -- 11.53 rubles and from slitting with stubble fields -- by 15.73 rubles compared to control. The profitability level was higher for sweep and minimal tilling: 71-78 and 108 percent.

Thus the most economically justified tilling of soil on slopes, in the sub-zone of dark chestnut soils, is that of sweep tilling with simultaneous slitting and slitting of untilled stubble fields. These soil-protective methods were introduced into operations on fields at the Sovkhoz imeni XXIII Partyezda in Alma-Atinskaya Oblast. Mouldboard plowing to a depth of 27-29 centimeters with the digging of holes furnished an increase in spring barley yield of 1.5 quintals per hectare (compared to control), sweep tilling to a depth of 27-29 centimeters with simultaneous slitting -- 2.9 quintals and slitting of autumn plowed land to a depth of 60-70 centimeters -- 2.4 quintals more from each hectare.

Based upon experimental data and a production inspection, we recommend for introduction into operations the following principal tilling of dark chestnut soils on slopes: sweep tilling with simultaneous slitting to a depth of 60-70 centimeters, slitting of stubble fields to a depth of 60-70 centimeters and mouldboard plowing with digging of holes.

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